THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 72: No. 7 *New York, Thursday, August 13. 1903.* $3.00 a Year, including Postage. Single Copies, 15 Cents.

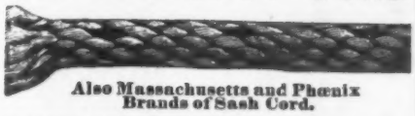
Librarian of Congress
Copyright Office
18 Jul 1904-d
Washington D C

Reading Matter Contents.....page 52
Alphabetical Index to Advertisers " 175
Classified List of Advertisers ... " 167
Advertising and Subscription Rates " 174

IRON AND STEEL
REPUBLIC IRON & STEEL COMPANY
CHICAGO, ILL.
PRODUCTS

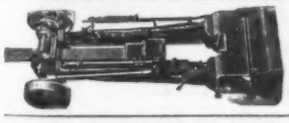
Bristol's Patent Steel Belt Lacing.
SAVES
Time, Belts, Money.
Greatest strength with Least Metal.

Send for Circulars and Free Samples.
THE BRISTOL CO., Waterbury, Conn.

SAMSON SPOT CORD

Also Massachusetts and Phœnix Brands of Sash Cord.
SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES.

Branch Office, 11 Broadway, New York.
Cleveland City Forge and Iron Co., Cleveland, O.


MERRILL BROS., 405 Kent Ave., BROOKLYN, N.Y.

BESSEMER PIG
PILLING & CRANE, Girard Building, Phila. Farmers' Bank, Pittsb'g Empire Bldg., New York Board of Trade, Boston

WE HAVE COMMON INTEREST WITH YOU

in galvanized iron: Return a whole sheet for an inch of fault.

It is the proper foundation for business.

American Sheet Steel Company
Battery Park New York

Remington
HAMMERLESS SHOT GUN
FOR $25.00.

Guaranteed for Nitro Powders.
Grade K Made with Remington Blued Steel Barrels.....$25.00
Grade K E D. Made with Damascus Barrels and Automatic Ejector.....$35.00.
Send for handsome new Catalog, just issued, containing complete description of Guns, $25.00 to $750.00. Mailed free.
REMINGTON ARMS CO., ILION, N. Y.
313-317 Broadway, New York. 86-88 First Street, San Francisco, Cal.
Sold by all Gun Dealers. Not Retailed by the Manufacturers.

CAHALL BOILERS See Page 126.

REGULAR PATTERN.

CAPEWELL HORSE NAILS
PLATE PATTERN. CORRUGATED PATTERN.
Branches:
NEW YORK, PHILADELPHIA, CHICAGO, ST. LOUIS, BOSTON, DETROIT, CINCINNATI, SAN FRANCISCO, PORTLAND, ORE., BUFFALO, BALTIMORE, NEW ORLEANS, DENVER.
THE CAPEWELL HORSE NAIL COMPANY
HARTFORD, CONN.

REGULAR PATTERN.

Excelsior Straight-Way Back Pressure Valve.
This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.
JENKINS BROTHERS, New York, Boston, Philadelphia, Chicago.

WANTED HEAVY MELTING STEEL SCRAP ALSO LOW PHOS. AND BASIC PIG IRON
For Sale High Grade Basic Open Hearth Steel Billets and Slabs
THE AMERICAN TUBE & STAMPING COMPANY
(Water and Rail Delivery) BRIDGEPORT, CONN.
SEE PAGE 28.

MAGNOLIA METAL.
Best Anti-Friction Metal for all Machinery Bearings.
Fac-Simile of Bar. Beware of Imitations.

MAGNOLIA METAL CO.,
Owners and Sole Manufacturers, Chicago, Fisher Bldg. 511-513 West 13th St., NEW YORK.
San Francisco, New Orleans, Montreal, Boston, Pittsburg and Philadelphia. We manufacture all grades of Babbitt Metals at competitive prices

THE
ANSONIA BRASS AND COPPER CO.
MANUFACTURERS OF
BRASS AND COPPER
Seamless Tubes, Sheets, Rods and Wire.

SOLE MANUFACTURERS
Tobin Bronze
(TRADE-MARK REGISTERED.)
Condenser Plates, Pump Linings, Round, Square and Hexagon Bars, for Pump Piston Rods and Bolt Forgings.
Seamless Tubes for Boilers and Condensers.
99 John Street, - - New York.

Randolph-Clowes Co.,
Main Office and Mill,
WATERBURY, CONN.
MANUFACTURERS OF
SHEET BRASS & COPPER.
BRAZED BRASS & COPPER TUBES.
SEAMLESS BRASS & COPPER TUBES
TO 36 IN. DIAM.
New York Office, 253 Broadway, Postal Telegraph Bldg., Room 715.
Chicago Office, 602 Fisher Bldg.

BRASS { SHEET ROD WIRE
COPPER { SHEET ROD WIRE
GERMAN SILVER { SHEET ROD WIRE
LOW BRASS. SHEET BRONZE. SEAMLESS BRASS AND COPPER TUBING. BRAZED BRASS AND BRONZE TUBING. : : : : : : : :
WATERBURY BRASS CO.,
WATERBURY, CONN.
130 Centre St., New York. Providence, R. I.

GENUINE No. 1 BABBITT.
Handiest Metal you can use, as there is practically no shrink in it. Ever tried it? Saves in every way—Time, Money and Patience.
GREATEST DURABILITY.
Bridgeport Deoxidized Bronze and Metal Company,
Bridgeport, Conn.

THE PLUME & ATWOOD MFG. CO.,
MANUFACTURERS OF
Sheet and Roll Brass
—AND—
WIRE
PRINTERS' BRASS, JEWELERS' METAL, GERMAN SILVER AND GILDING METAL, COPPER RIVETS AND BURRS.
Pins, Brass Butt Hinges, Jack Chain, Kerosene Burners, Lamps, Lamp Trimmings, &c.
39 MURRAY ST., NEW YORK.
144 HIGH ST., BOSTON.
199 LAKE ST., CHICAGO.
ROLLING MILL: THOMASTON, CONN. | FACTORIES: WATERBURY, CONN.

SCOVILL MFG. CO.,
Manufacturers of
BRASS, GERMAN SILVER
Sheets, Rolls, Wire, Rods, Bolts and Tubes, Brass Shells, Cups, Hinges, Buttons, Lamp Goods.
SPECIAL BRASS GOODS TO ORDER
Factories, WATERBURY, CONN.
DEPOTS:
NEW YORK, CHICAGO, BOSTON.

JOHN DAVOL & SONS,
AGENTS FOR
Brooklyn Brass & Copper Co.,
DEALERS IN
COPPER, TIN, SPELTER, LEAD, ANTIMONY.
100 John Street, - New York.

Matthiessen & Hegeler Zinc Co.,
LA SALLE, ILLINOIS.
SMELTERS OF SPELTER
AND MANUFACTURERS OF
SHEET ZINC AND SULPHURIC ACID.
Special Sizes of Zinc cut to order. Rolled Battery Plates.
Selected Plates for Etchers' and Lithographers' use.
Selected Sheets for Paper and Card Makers' use.
Stove and Washboard Blanks.
ZINCS FOR LECLANCHE BATTERY.

Arthur T. Rutter
SUCCESSOR TO
WILLIAM S. FEARING
256 Broadway, NEW YORK.
Small tubing in Brass, Copper, Steel, Aluminum, German Silver, &c. Sheet Brass, Copper and German Silver. Copper, Brass and German Silver Wire. Brazed and Seamless Brass and Copper Tube. Copper and Brass Rod.

BRASS FOUNDERS FINISHERS J. J. RYAN & CO.
6874 West Monroe St. Chicago.
Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS On Short Notice.

CONTRACTS SEND IN YOUR ORDERS WANTED FOR LIGHT METAL WORK WILL BE GLAD TO MAKE PRICES Low SPECIAL FACILITIES FOR MAKING MODELS
F. WELCH MFG. CO. 9 SUDBURY ST. BOSTON

BRASS, BRONZE and ALUMINUM CASTINGS.
Founders, Finishers.
W. G. ROWELL & CO., BRIDGEPORT, CONN.

"Search-Light"
OIL and GAS
Bicycle Lanterns.
Send for Circulars and Electrotypes.
THE BRIDGEPORT BRASS CO.,
Bridgeport, Conn.
19 Murray St., N. Y. 17 No. 7th St., Philadelphia. 85 to 87 Pearl St., Boston.

HENDRICKS BROTHERS
PROPRIETORS OF THE
Belleville Copper Rolling Mills,
MANUFACTURERS OF
Braziers' Bolt and Sheathing COPPER,
COPPER WIRE AND RIVETS.
Importers and Dealers in
Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST., NEW YORK.

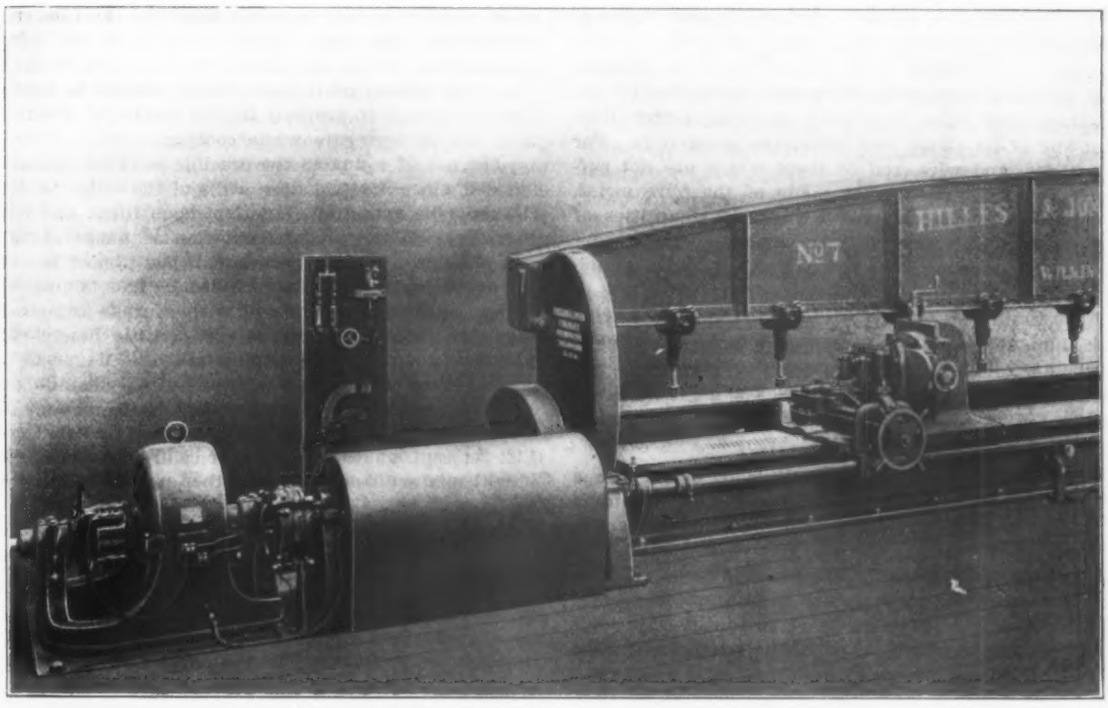
No better coun... made.
4 Wheel, $3.00
5 Wheel, $3.25
Guaranteed.
R. A. HART, BATTLE CREEK, MICH.

THE IRON AGE

THURSDAY, AUGUST 13, 1903.

The Hilles & Jones Heavy Plate Planer.

The heavy plate planer here shown was built by Hilles & Jones of Wilmington, Del., for the United States Navy Yard at Charlestown, Mass. Direct connected to the main driving screw of the planer, through gearing and magnetic clutches, is a 50 horse-power Westinghouse multipolar motor of 220 volts. This runs at slow speed and furnishes ample power to enable the machine to plane 2-inch armor plate, taking a heavy chip. The saddle is the firm's standard three-tool type, two tools being mounted in one block which is automatically reversed at each end of the stroke. One tool cuts in each direction. A third tool is carried in a swiveling slide, which allows planing vertically or at any angle. The machine will plane plate 32 feet long at one setting, or any length by resetting. The motor runs in one direction all the time, the reversing of the carriage being accomplished by clutches.



THE HILLES & JONES HEAVY PLATE PLANER.

The Premier Steel Works Dismantled.

The Premier Steel Works, at Indianapolis, Ind., have been dismantled by Wickes Brothers of Pittsburgh, Pa., who purchased the plant from Crawford Fairbanks and Major Collins, the latest owners. Wickes Brothers are manufacturers of boilers and machinery and are also dealers in second-hand machinery. The wrecking of the plant has been an arduous task. Before some of the great bolts that held the machinery on its foundations could be removed the workmen had to use dynamite to blow the cement from around them. Much of the machinery has been removed to Pittsburgh, comprising engines with 36-inch cylinders, as well as smaller ones, heavy roll trains, shears capable of cutting steel 7 inches square, &c.

One interesting feature of the work is that the firm contracted to move a building 260 feet long and 64 feet wide to Pittsburgh, setting it up in Pittsburgh in exactly the same condition as in Indianapolis. This was the south mill of the Premier plant, and it was sold to the Graham Nut Company. As it was taken down each piece was numbered, so that no trouble would be encountered in re-erecting it at Pittsburgh.

The history of the Premier Steel Company is one of ups and downs. The plant was established by the Indianapolis Rolling Mill Company in 1857. It was originally operated to make iron railroad rails and was a financial success in that capacity; but when steel rails came into demand the mill proved a losing venture. In 1889 the Premier Steel Company purchased the rolling mill and proceeded to convert it into a Bessemer plant, putting in a blooming mill. About the same time another company were organized, called the Indiana Steel Company, to manufacture structural shapes as a side line. The Indiana Steel Company leased a part of the Premier plant. Both companies began to spend money to make the business a success. Everything looked sunny until the panic of 1893 clouded their prospects. Both companies were finally compelled to close down, and in 1893 Charles W. DePauw asked Judge Edgar Brown of the Circuit Court to appoint a receiver for the Premier Steel Company, and John E. McGettigan was appointed receiver for the plant in 1893, but did not operate it. In 1901 Receiver McGettigan sold the plant to W. J. McCarlin of Pitsburgh for $125,200. He organized a company, but after a brief operation the plant was again closed and called a losing venture. Legal complications arose and a compromise was finally effected in which Crawford Fairbanks and Major Collins became possessed of the property.

The dismantling of the plant dissipated the dream of the successful establishment of a great steel works at Indianapolis. Machinery that cost millions has been sold for a mere pittance in comparison. Giant engines, rolls and shears were marketed at figures almost equal to that of scrap iron.

The Light Aluminum Alloys.*

BY DR. JOSEPH W. RICHARDS, BETHLEHEM, PA.

Pure aluminum, like pure gold, silver or copper, is a comparatively soft and weak metal; it has many of the properties of copper, being easily cut by a knife and having a fibrous, silky fracture. The pure metal hardens quickly while being worked, faster when worked cold, and becomes harder, denser, more elastic and stronger, but soon goes to pieces if worked too far. The hard drawn aluminum wire or hard rolled sheet or rod have strong physical resemblances to hard drawn or hard rolled copper. To produce thin sheet or fine wire it is necessary to anneal frequently, to remove the strains caused by the working. Castings of aluminum, unworked, are soft and weak.

The following table gives the usual limits of physical properties of number 1 commercial aluminum, which averages 99 to 99.5 per cent. pure:

	Elastic limit. (Pounds per square inch.)	Ultimate tensile strength. (Pounds per square inch.)	Percentage reduction of area.
Castings	8,500	14,000 to 18,000	15
Sheet	12,500 to 25,000	24,000 to 40,000	20 to 30
Wire	16,000 to 33,000	25,000 to 55,000	40 to 60
Bars	14,000 to 23,000	28,000 to 40,000	30 to 40

For all purposes where the rolled, drawn or worked pure metal is sufficiently hard and strong it is advisable to use the pure metal, since it resists alteration by the atmosphere and other corroding agencies better than almost any of its alloys, and better the purer it is. For cast articles, and wire, rod or sheet which are not sufficiently strong or hard when made of the pure metal, the aluminum can be alloyed with small quantities of other metals, which improve it in various ways, without materially increasing its specific gravity. Pure aluminum has a density of 2.6 to 2.7, while the light alloys of which we shall treat contain up to 33 per cent. of foreign metals, and range in density from 2.4 to 3.6. The principal metals which have been proposed or used for these alloys are zinc, copper, nickel, magnesium, titanium, tungsten, chromium, manganese and silver.

Alloying the Metals.

The components of the alloy should be of as pure a quality as it is possible to get them. The aluminum used should be of No. 1 quality, which averages now 99.5 per cent. aluminum. For the very best results the extra quality, sold as 99.75 pure, should be used. The commercial qualities of the other metals are frequently so impure that they give alloys of quite different properties from the pure metals. This is particularly true of zinc, the ordinary Western brands of which contain 1 per cent. or more of lead and often considerable iron. In this case it pays to purchase the redistilled zinc or the best varieties of Bertha or Sterling spelter.

As a general rule, it is advisable to melt the aluminum first, and then to stir or dissolve the other metal into it. Most metals, particularly copper, unite with aluminum with considerable energy, and dissolve quickly in it, even though their melting point may be considerably higher. To facilitate the solution of a metal of very high melting point, such as nickel, it is advisable to prepare first an alloy of the metal with aluminum in somewhat like equal proportions. This alloy, cast into bars, is then added to the melted aluminum, and dissolves much faster and more uniformly than the pure metal.

The melting can ordinarily be performed in graphite or plumbago crucibles in a melting hole. The crucible should stand on a refractory pedestal, to keep the bottom from being chilled should the fuel be burnt out beneath it, and to avoid it tipping. It should be covered tightly, in order to avoid absorption of gases, or the accidental dropping in of coke. If the alloying is being performed, the metal is best kept covered with lumps of charcoal, to keep air from striking the surface, but this is not needed or recommended if the operation is simply a melting.

Since the fire is hotter than the crucible, and the crucible wall hotter than the metal inside, it is of great importance that the fire be not too hot and the metal not overheated. Aluminum alloys, like aluminum, have large specific heats, and it takes a large amount of heat, though not a high temperature, to melt them. The characteristic of the furnace operation is therefore to have only a moderately hot fire, and then wait with patience until the metal melts, which will take from 30 to 50 minutes, starting with a cold crucible. The disadvantages of overheating the metal are three, viz.: It absorbs more gases; it will probably be poured too hot and segregate in the mold: it will react on the crucible itself, reduce from it iron and silicon, and become brittle. It is of the greatest importance that the alloy be never over a cherry red heat, and it should never adhere to or wet the crucible. The stirring rod may be iron, preferably a wrought iron bar, if the temperature is carefully kept low. If the temperature is too high the iron bar will be wetted and corroded and the alloy injured. Until experience has been gained, it is better to use a carbon rod for a stirrer, fastened into the end of an iron pipe for a handle.

When the alloying metal has been all dissolved the whole is stirred vigorously and cast at once. Letting it stand some time in the furnace produces a somewhat closer alloy, but the deterioration caused by increased gases and impurities taken up from the crucible usually overbalance the gain. After taking from the furnace, the crucible should be placed on some fire bricks and the metal stirred as it cools, and it should be cast only just hot enough to properly fill the mold. If cast too hot it is apt to segregate while cooling.

The use of a flux in the crucible is in no case recommended, since it attacks the walls of the same, facilitates the reducing action of aluminum upon them, and injures the alloy. With careful regulation of temperature and use of no flux, a good crucible will last almost indefinitely, not being wetted or corroded. Iron skimmers or ladles may be coated inside with a wash composed of finely ground bauxite mixed with a little lime. This is practically unattacked by any alloy. Magnesia lined crucibles are best for this work, when they can be gotten.

With some metals there is a limit to the amount which aluminum can take up. Thus, it can keep in solution only 1.92 per cent. of lead, or 3.39 per cent. of cadmium, while it will mix with most of the other metals in all proportions.

Melting Points.

Almost all the light, strong alloys melt easier than aluminum. The addition of a few per cent. of any metal to aluminum lowers the melting point, even though the metal added has a high melting point. There is a limit, however, in some cases, to the amount of foreign metal which can be taken up without increase of melting point. Adding copper, the melting point decreases until 33 per cent. of copper is present, above which it rises. Antimony is the most striking exception, for small quantities increase the melting point very considerably; 33 per cent. of antimony makes an alloy melting only at 230 degrees higher than aluminum and 250 degrees higher than antimony. Of the commercial alloys, however, containing small percentages of zinc, copper, nickel or magnesium, it may be said that they melt either as easily as or slightly more easily than aluminum itself.

Specific Gravity.

The alloys with magnesium, 2 to 12 per cent., are the only ones which are lighter than aluminum itself; but they are lighter than their composition and the specific gravity of magnesium (1.72) would lead us to expect. Thus, 10 per cent. of magnesium would theoretically make a physical mixture with a specific gravity 0.16 less than aluminum, whereas it really gives an alloy 0.24 lighter. This points to expansion taking place during alloying, in this case. In the case of the other metals heavier than aluminum, their specific gravity is usually higher than would be calculated from the composition, pointing to a condensation or contraction taking place in alloying. In fact, with small percentages of copper, iron and nickel, the contraction taking place in alloying is so great that the alloy occupies less volume than the aluminum alone entering into it. In these cases it appears as if the molecules of alloying metal slip in between the

* A paper read before the American Society for Testing Materials, at Delaware Water Gap, July 3, 1903.

molecules of the aluminum, thus accounting for the increased hardness and tenacity of the alloy. The magnalium alloys range from 2.4 to 2.57 in specific gravity; the heavier metal alloys from 2.6 to 3.6. In general the light aluminum alloys are one-fourth to one-half as heavy as the structural metals which they replace.

Molds.

For general castings a loose texture green sand is suitable. Numerous air vents must be supplied, and a large casting gate and heavy feeders at heavy parts of the casting. In such molds the alloys are poured cold, and as fast as possible, to prevent chilling. In spite of this the slow cooling renders the alloy ununiform by segregation, and therefore not so strong as chilled castings. To partly avoid this the castings are shaken loose from the sand as soon as they are set. Slabs and rods for rolling and drawing are cast in chill molds, as are also any objects needed in large quantities. This makes the material soft, uniform and stronger than if cast in sand, with a smoother surface.

Working and Annealing.

All these alloys are hardened and stiffened by working and must be frequently annealed to avoid cracks and breaks. The slabs and billets are best broken down, while warmed to 150 to 250 degrees C., under a steam hammer; afterward steel rolls with good surfaces are used, and about as much power is required as for rolling hot steel of similar section. Imperfections in the casting must be scraped or gouged out before breaking down. Slabs are usually rolled two passes lengthwise, increasing the length 20 per cent., and then are turned to 90 degrees and rolled out further. The rolls should be at 150 to 200 degrees C., and if polished sheet is required the sheet is polished before being sent through the final polishing rolls. Working raises the tensile strength but decreases ductility and frequent annealing is necessary.

The annealing is done in a muffle, if possible, as it is advisable not to subject these alloys, especially magnalium, to the direct action of the flame, since absorption of gas and internal oxidation, or burning, takes place at redness without melting. Slabs and bars are heated to full dark red, so that a pine stick carbonizes when drawn over them. Sheet must not be heated so high; a thin sheet is merely warmed to about 400 degrees C. and then cooled in water. Very thin sheet can be put into hot oil and this allowed to cool slowly.

Dipping and Frosting.

Alloys with magnesium or zinc can be given a pure, white silvery surface by putting into a 10 per cent. caustic soda solution, containing 2 per cent. of common salt and warmed to 60 degrees C. The object is kept 15 to 20 seconds in this, until a violent evolution of gas appears, then washed in cold water and brushed; then dipped 10 to 15 seconds in concentrated nitric acid, again washed in cold water, and then dried in fine, warm sawdust. The soda solution is held in an iron vessel; the nitric acid in clay, porcelain or slate. The dipping is particularly recommended for rolled slabs, after the first annealing, as any casting defects are thus shown up, and can be eradicated by cutting out or using emery paper. By repeated dipping a fine, silky matte is obtained, which is absolutely unalterable in air. For alloys containing copper or nickel the soda solution is replaced by dilute hydrofluoric acid. A dull black finish may be obtained by using dead india black varnish and keeping one hour at 100 degrees C. A shining black can be obtained by using black stove varnish and keeping one to one and one-half hours at 50 degrees C.

Alloys with Chromium.

Chromium hardens aluminum strongly, the alloys having somewhat of the qualities of self hardening steel—*i.e.*, retaining their hardness on heating or after annealing much better than any other of the aluminum alloys. Two to 3 per cent. of chromium is recommended as making the metal much harder but decreasing malleability considerably. Eleven per cent. makes the alloy brittle, crystalline and unworkable; 3½ per cent. makes an alloy which can be hammered and rolled, but is very stiff and "crackelly." Its mechanical properties are given by Lejeal as:

	Tensile strength. (Pounds per square inch.)	Elongation. (Per cent.)
Hard rolled	18,000	12
Annealed	17,500	7

Professor Langley made 2 and 3 per cent. alloys by dissolving chromium oxide in a bath of melted fluorides of aluminum, sodium and calcium, and then pouring in metallic aluminum in the required quantity. Chromium alloys are being used commercially at present, but the writer cannot say to exactly what extent.

Alloys with Titanium.

Alloys up to 7 per cent. of titanium have been made, but the best is that with 2 per cent. This has elasticity comparable to spring brass, and a tensile strength of 30,000 to 35,000 pounds when rolled hard with 3 per cent. elongation, and 21,000 pounds when annealed, with 16.5 per cent. elongation. These alloys are difficult to make, as pure titanium is rare, and the only practicable method of manufacture is to dissolve titanic oxide in melted cryolite and add aluminum, which latter reduces the oxide and forms an alloy with the metal. If chromium oxide is added also a triple alloy of chromium, titanium and aluminum is obtained, which is very hard and rigid, and holds a cutting edge fairly well. The titanium alloys have a dull, leady color, and are corroded more rapidly than many other of the aluminum alloys, so that their use has practically disappeared.

Alloys with Manganese.

A. H. Cowles patented some years ago the addition of manganese to commercial aluminum up to 5 per cent., producing particularly hard and rigid alloys. They can be made either by making a rich alloy of manganese and aluminum in the electric furnace, and diluting this down with pure aluminum, or by adding manganese oxide to the electrolytic bath in which aluminum is being produced in quantity sufficient to form the desired alloy with the aluminum of the alumina being decomposed. The addition of rich ferromanganese to aluminum also serves to produce the alloys, but it has the disadvantage of introducing some iron and carbon into the alloy at the same time. Susini makes a series of alloys of aluminum with 3, 5, 8 or 10 per cent. of alloying metals, the latter being zinc, copper and manganese. He makes the alloy of the three latter in a graphic crucible, melts the required quantity of aluminum at a red heat and then pours the liquid alloy into it. The three alloys he recommends must contain in percentages:

Manganese.	Copper.	Zinc.
1 to 3	1.5	0.5
1 to 5	2.5	1.0
2 to 8	4.5	1.5

Used with copper and nickel, manganese makes the hardest light alloy of aluminum yet produced.

Alloys with Tin.

The alloy of aluminum with 10 per cent. of tin was strongly recommended by Mr. Bourbouze. It is whiter than aluminum, its density is 2.85, its coefficient of expansion by heat is less than that of aluminum and it can be more easily soldered than pure aluminum. The tensile strength of a casting of this alloy showed only 14,000 pounds per square inch, with 4 per cent. elongation, so that it is no stronger than pure aluminum and not as ductile. The alloy is said to be improved by the addition of 3 per cent. of nickel. As far as the writer is informed, the use of this alloy has disappeared. Tin is still used in some of the other light aluminum alloys, in small quantities of not over 2 per cent., to contribute to the easy fusibility of the alloy and to decrease the shrinkage. If phosphorus is simultaneously desired in the alloy the commercial phosphor tin is employed.

The best material for soldering aluminum is an alloy of 29 parts tin, 11 parts zinc, 1 part aluminum and 1 part of 10 per cent. phosphor tin—patented by the writer's father. This alloy, however, is only 2.4 per cent. aluminum, and belong to the heavy alloys.

Alloys with Silver.

Aluminum will absorb up to 5 per cent. of silver without increasing in volume; the alloys thus made are whiter, harder, denser and stronger than pure aluminum, and take a high polish, which they retain better than

almost any other alloy of aluminum when exposed to corrosion. For the latter reason, particularly, they have been used since the early days of the aluminum industry, particularly when aluminum itself was almost as high priced as silver, for opera glasses, telescopes, statuettes, fine light weights, the beams and hangers of fine balances, fine instruments and electrical apparatus. Alloys up to 10 per cent. of silver can be worked, and 1 to 2 per cent. of copper is simultaneously used to reduce the cost of the silver by partly replacing it. Alloys with 3 per cent. silver have been used for statuettes, with 5 per cent. for dessert spoons, fruit knives and watch springs, with 3 per cent. silver and 2 per cent. copper for balance beams, with 5 to 9 per cent. silver and 1 per cent. copper for cast dental plates. Where cost is a secondary consideration, and fine grain, fine color and unalterability are of first concern, the silver alloys are evidently still of some economic importance. The atomic weight of silver (108) is exactly four times that of aluminum (27), and their specific gravities are in the same ratio, and it is probable that this has some connection with the characteristic improvement in color, grain and resistance to corrosion which these alloys show.

Alloys with Nickel.

As far as the writer can find out, alloys of aluminum with nickel alone have not been found advantageous. Lejeal prepared an alloy with 4.5 per cent. nickel, which had a coarsely crystalline fracture, rolled and worked well, but had poor mechanical properties. The commercial alloys which go under the name of nickel-aluminum alloy are in reality ternary alloys of aluminum with nickel and copper. The alloys made for rolling contain 2 to 5 per cent. of nickel and copper together, the larger part being usually copper. The plates of the yacht "Defender" were made of this alloy. They were very satisfactory mechanically, showing an average elastic limit of 30,000 pounds per square inch, ultimate strength 40,000 pounds, with 10 per cent. elongation in 2 inches and 15 per cent. reduction of area. The specific gravity was 2.75. The plates were unfortunately fastened in place by steel rivets and were not insulated from the Tobin bronze sheathing below the water line, with the consequence that the aluminum plates were badly corroded in two years' time.

What are called nickel-aluminum casting alloys contain 7 to 10 per cent. of nickel and copper together, have a specific gravity of 2.80 to 2.85, contract 3-16 inch in setting, and have, in castings, an elastic limit of 8500 to 12,000 pounds, ultimate strength of 15,000 to 20,000 pounds, with reduction of area of 6 to 8 per cent. A sample of this alloy tested by the Bethlehem Steel Company contained 3½ per cent. of copper, no nickel, and had a tensile strength in casting of 15,000 pounds with 1 per cent. extension. This test shows that buyers of commercial alloys should require a guarantee as to composition, as well as mechanical properties.

The alloying of pure nickel with aluminum is not an easy matter, and is best accomplished by adding nickel oxide to the bath in which aluminum is being manufactured or by reducing nickel oxide by an excess of aluminum itself, and thus obtaining a rich alloy of the two metals, from which the alloys with lower proportions of nickel can be manufactured.

Alloys with Tungsten.

The precise effects of tungsten alone have not been very satisfactorily determined, since it is used in small amounts in conjunction with other hardeners of aluminum, such as with copper and iron, or copper and manganese, &c. Le Verrier gives the properties of the alloy with 7.5 per cent. of tungsten as being:

	Tensile strength. (Pounds per square inch.)	Elongation. (Per cent.)
Cast	22,000	1.5
Rolled hard	35,000	4.0
Annealed	25,000	10.0

Such an alloy would be difficult to make, expensive and not worth, mechanically, its increased cost.

Mannesmann, in making aluminum tubes, found that a fraction of 1 per cent. of tungsten made the metal stronger and increased its resistance to corrosion. Under the trade name of wolfram aluminum, aluminum alloy with a small amount of tungsten has been used extensively in military experiments, the metal rolling, drawing and spinning well without tearing or smearing the tools.

These alloys were made by adding tungstate of soda or tungstic oxide to the reducing bath in the manufacture of aluminum. At present metallic tungsten in powder, made by the Goldschmidt process, is available for alloying, and the alloys can be made directly. In this way several special alloys have been manufactured and have attained to somewhat extensive use in Europe.

Wolframium contains, according to an analysis by Minet, 98.04 per cent. aluminum, 0.375 copper, 0.105 tin, 1.442 antimony and only 0.038 tungsten. It is therefore principally an antimony alloy, the antimony giving it good casting qualities, while the copper gives strength and the tin fusibility. It is difficult to see that any of its qualities could be influenced by so small a content of tungsten. The inventors (Reinhard and Roman) state in a very general way that manganese or nickel may replace more or less of the copper, tin or antimony. Its color is like silver, it polishes finely, its resistance to corrosion is said to equal that of pure aluminum, it casts well in sand or chills, and rolls, draws and works well generally. Its mechanical properties are stated to be:

	Tensile strength. (Pounds per square inch.)	Elongation. (Per cent.)
Hard rolled	52,000	2.14
Annealed	38,000	15.24

As this is a patented alloy the above claims of the inventors may be taken *cum grano salis*.

Partinium, the invention of G. H. Partin of Paris, contains 96 per cent. aluminum, 2.4 antimony, 0.8 tungsten, 0.64 copper, 0.16 tin. It is therefore much more of a tungsten alloy than the so-called wolframium. The inventor states, however, that the tungsten and antimony may be replaced in the alloy by magnesium, which would be an entire transposition of the composition of the alloy. Quite an extensive and noteworthy display of this alloy was made at the Paris Exposition of 1900, and it is quite possible that it is still in extensive use in France, particularly in the manufacture of automobile equipment.

Alloys with Copper.

Copper is one of the most frequenty used hardening agents for aluminum, being often used alone and often associated with zinc, nickel and other metals. Captain Julien, making experiments for materials suitable for air ships at the Park of Meudon, near Paris, obtained the following tests on sheet 1 mm. thick, hard rolled:

Per cent. of copper.	Specific gravity.	Tensile strength. (Pounds per square inch.)
0	2.67	26,500
2	2.71	43,500
4	2.77	44,000
6	2.82	55,000
8	2.84	56,000

In castings these copper alloys are only slightly stronger than pure aluminum, because of the segregation of the alloy, which takes place during slow cooling. It is only in chill castings that satisfactory results can be obtained. Slabs and bars for rolling or drawing should be cast in chill molds.

German silver contains approximately 1 part zinc, 1 part nickel and 3 parts of copper. Two to 3 per cent. of German silver alloyed with aluminum gives an alloy of approximately ½ per cent. each of nickel and zinc and 1 to 2 per cent. copper. Such an alloy gives a tensile strength in castings of 22,000 pounds and in hard rolled sheet of over 40,000 pounds, with 3 to 5 per cent. elongation. This alloy, first described by the writer, is very elastic and of a fine white color, and is easily made by using commercial German silver, which contains the copper, zinc and nickel already perfectly alloyed with each other.

Alloys with Magnesium.

The following tests are furnished by the Magnalium Gesellschaft of Berlin, as representing the properties of these alloys:

Per cent. magnesium in alloy.	Tensile strength. (Pounds per square inch.)	Elongation. (Percentage.)
Two per cent.:		
Cast in sand	17,900	3.0
Cast in chills	28,600	2.0
Castings, water chilled	40,000	1.0
Annealed sheet	25,600	18.0
Hard sheet	41,300	2.7
Four per cent.:		
Cast in chills	28,600	2.0
Annealed sheet	28,700	8.0
Hard sheet	44,900	2.1
Six per cent.:		
Castings, water chilled	57,600	1.0
Annealed sheet	28,100	17.0
Hard sheet	44,100	1.0
Eight per cent.:		
Castings, water chilled	54,900	1.6
Ten per cent.:		
Cast in sand	21,400	2.4
Cast in chills	33,600	3.4
Castings, water chilled	61,100	4.2

These alloys have been patented by L. Mach. They cost considerably more than pure aluminum, because of the market price of magnesium being in Germany $1 per pound. The use of these alloys in Europe is reported to be already considerable and to be increasing. No data regarding their durability is yet at hand.

Alloys with Zinc.

Zinc is the cheapest and at the same time one of the most efficient of the metals which improve the mechanical properties of aluminum. Proportions up to 33 per cent. are used: the alloys are malleable up to 15 per cent. and above that are still useful for making castings. Only the purest aluminum should be used, to get the best alloys. Casting in chills gives much better results than casting in sand; in the latter case the slow cooling seems to cause a separation.

The alloys are made by melting first all the aluminum to be used in a clean graphite crucible, bringing it a little above the melting point so that as the zinc is added, in small pieces, it does not chill the aluminum, but is all absorbed directly as it is added. The melting point decreases as zinc is added, so that if the zinc is added slowly the alloy remains always melted. A wrought iron rod can be used as a stirrer, if the heat does not at any time go above low redness. The metal should be poured as cold as is practicable; when much hotter than its melting point it is not so thinly fluid as when somewhat cooler. The crucible should be kept covered while melting the aluminum, and no charcoal or flux put into the crucible, except possibly a little salt.

The alloy with 15 per cent. zinc can be rolled and drawn. In chill castings it has an elastic limit of 16,000 pounds per square inch, a tensile strength of 22,330 pounds, an elongation of 6 per cent. in 2 inches and reduction of area of 10½ per cent.

The alloy with 25 per cent. zinc has a tensile strength of 22,000 pounds, extension 1 per cent. and reduction of area 3 per cent., when cast in sand. When cast in chill molds its tensile strength is 35,000 to 45,000 pounds, extension 1 per cent., with a close fracture like high carbon steel. Its specific gravity is 3.4, which shows a contraction of 14 per cent. in the bulk of the constituents while alloying, and since one part of zinc has only one-eighth the volume of three parts of aluminum, the remarkable conclusion follows that the aluminum takes up one-third of its weight of zinc and actually decreases in volume some 2 per cent. in doing it. This probably accounts for the close grain and good working qualities of this alloy. It is nonmagnetic, has a fine color, takes a high polish, and bids fair to be the most generally useful of all the light aluminum alloys.

The alloy with 33 per cent. of zinc, sometimes called the Sibley casting alloy because first made in the Sibley Laboratory at Cornell University, is extremely rigid, very slightly elastic, and breaks short like cast iron, with a fine grained fracture. It is not so resistant to shock as the alloy containing less zinc. Its specific gravity is only 3.8 and its volume is only 1.5 per cent. greater than the aluminum from which it is made. Its tensile strength is 24,000 pounds in sand castings and up to 40,000 pounds in chill castings, with no perceptible elongation or contraction of area. It works well, without requiring lubrication of the cutting tools. The large proportion of zinc in it makes it the cheapest of all the light aluminum alloys.

Besides these alloys with zinc alone, several casting alloys have been made containing both zinc and copper. Considerable amounts of alloys with 5 per cent. copper and 15 per cent. zinc, and as high as 27 per cent. zinc and 3 per cent. copper, have been made and used commercially. When cast under pressure they are stronger.

A commercial casting alloy being sold at present contains 15 per cent. of zinc and 5 per cent. of other hardeners—viz., 2 per cent. tin, 2 per cent. copper and half of 1 one per cent. each of iron and manganese. It is recommended as making sharp, hard, strong castings.

Conclusion.

According to the claims made, the magnesium alloys are the best all around of the light aluminum alloys, but they are expensive; the zinc alloys are the cheapest to make, and are equal in mechanical properties to very nearly the best alloys made with more expnsive metals, and therefore promise to have, of all the light aluminum alloys, the largest sphere of usefulness.

The Providence Steel Casting Company.

The Providence Steel Casting Company of Providence, R. I., are to erect a steel foundry this season, plans having been prepared and the building contract being soon to be let. The company will produce steel castings by the Tropenas process, having secured the patent rights for Rhode Island and a portion of Massachusetts. A tract of land has been purchased between Allen avenue and the water front, with a frontage of 157 feet on the street and a depth of 356 feet. The purchase includes to the harbor line, so that by filling where is now shallow water, even at high tide, the land may be extended 800 feet farther, making its depth from Allen avenue nearly 1200 feet. On the property will be erected immediately a foundry building 118 x 150 feet, and an office building, 20 x 32 feet and two stories in hight, the plan being to give over the second story to the laboratory. The foundry building will have a high monitor roof over the main span, which will be 50 feet, and wings, one 25 feet, the other with two spans, 25 and 18 feet, respectively. The foundry will have every modern convenience for handling raw materials and the finished product of its converters. A 10-ton electric traveling crane will cover the main floor. An electric elevator will be installed to raise material to the converters. A 250 horse-power Almy water tube boiler will provide steam at 180 pounds pressure for a high pressure upright compound engine, whose direct connected generator will provide electricity for light and power, for every machine in the foundry will be motor driven, without shafting. Provision will be made for two converters, but one only will be installed as a beginning. There will be an air compressor and a high and a low pressure blower. A spur track from the New York, New Haven & Hartford Railroad will enter the yard and will be extended to the wharf, that it may be utilized for the moving of iron, coke, coal and other materials from vessels to the foundry bins adjacent to their point of consumption, and in placing heavy castings on the dock. The wharfage is exceptional, with a slip 120 feet wide, a wharf already built, 90 x 150 feet, and room to make it 90 x 250 feet, which will be taken advantage of.

The Providence Steel Casting Company is incorporated under the laws of Rhode Island, with a capital stock of $150,000, subscribed for at par. The officers are: President, Darwin Almy, head of the Almy Water Tube Boiler Company; vice-president, F. W. Hartwell; secretary, J. C. Hartwell; treasurer, E. M. Shaw, one of the most prominent of the New England steel men. The directors are: Darwin Almy, F. W. Hartwell, E. M. Shaw, Walter S. Almy and Charles H. Almy.

It is confidently expected that the city of Providence alone will keep busy the foundry as planned, and that a larger plant will be required before the business has been in operation a great while. The Tropenas process is now in successful use in a number of American plants, including the Navy Yard at Washington, where it is stated the percentage of loss in casting shells has been exceedingly small under this process. The Newport News Shipbuilding Company is about to install a similar plant.

The Lindemann & Hoverson New Factory.

The A. J. Lindemann & Hoverson Company have completed the greater part of their new works, which they have for some time had under erection in the southern section of the city of Milwaukee, Wis. The company are manufacturers of gasoline and oil stoves, steel ranges, portable ovens, stove pipe, elbows, roasting pans and other sheet metal goods. They had for a long time been conducting their manufacturing operations in the heart of the business section of the city, and like other enterprising manufacturers, found that the growth of their business called for much more extensive quarters and for improved facilities of every kind. About three years ago they purchased a tract of land along the line of the Chicago & Northwestern Railway Company, comprising 6 acres, upon which they decided to build a completely new plant, which they determined would be as perfect in every respect as it would be possible to make it. They embody in their design and construction such features as would make the works a model of their kind. The buildings are therefore of a most substantial character. The foundry buildings have heavy brick walls and steel truss roofs. The main factory building and the japanning building are constructed with heavy brick walls, steel columns and girders, and have cement floors laid on expanded metal in every story, while the windows are all fitted with wire glass. Even the stairways are fireproof. The pattern storage building, which is absolutely fire proof, is built of brick with a cement floor and a roof composed of expanded metal and cement, while the electric lights are operated by an automatic switch, which is opened or closed by the movement of the door. The pattern shop and carpentry building, which is a frame structure, is fitted with a cement floor, and also has a ceiling composed of expanded metal and cement, thus reducing danger of fire. Cement has been used most lavishly for construction purposes. The buildings are all insured in the New England Manufacturers' Mutual Fire Association, and the entire system of fire protection has been

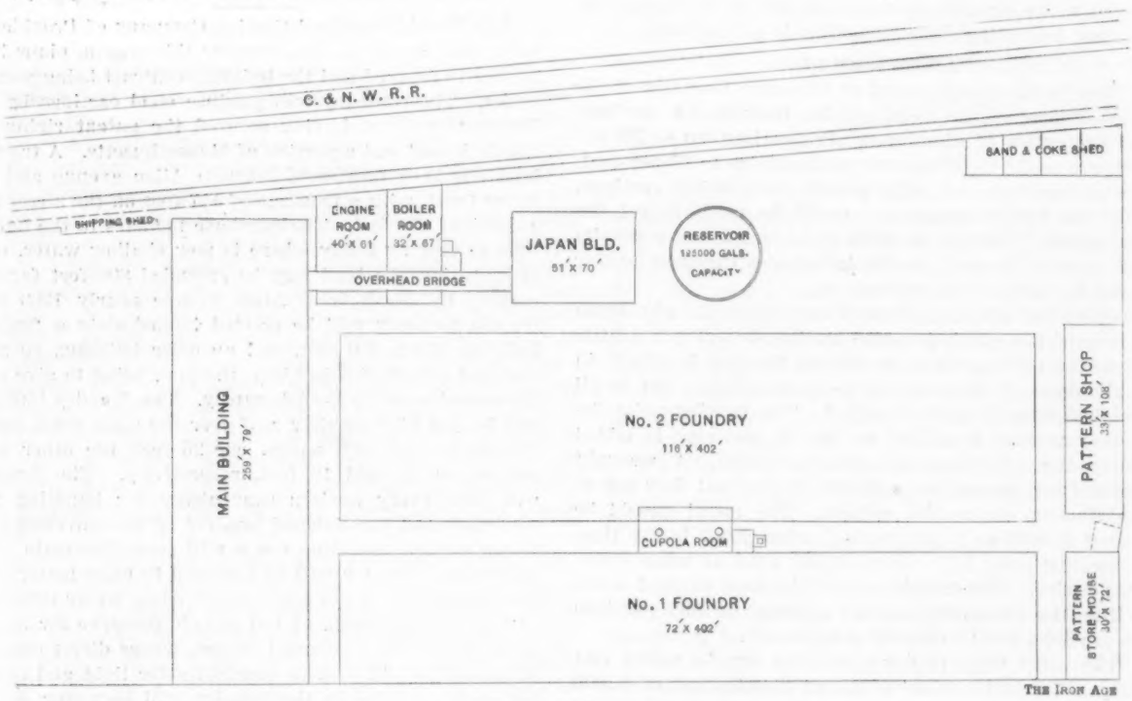

C. & N. W. R. R.
SAND & COKE SHED
SHIPPING SHED
ENGINE ROOM 40′ X 61′
BOILER ROOM 32′ X 67′
JAPAN BLD. 51′ X 70′
RESERVOIR 125000 GALS. CAPACITY
OVERHEAD BRIDGE
MAIN BUILDING 259′ X 79′
No. 2 FOUNDRY 116′ X 402′
PATTERN SHOP 33′ X 108′
CUPOLA ROOM
No. 1 FOUNDRY 72′ X 402′
PATTERN STORE HOUSE 30′ X 72′
THE IRON AGE

Fig. 1.—Ground Plan.

THE LINDEMANN & HOVERSON NEW FACTORY.

especially need a foundry for the purpose of producing their own castings, and for this reason pushed the work of erecting a foundry as the first step. It was therefore built and put in operation about two years ago. After it was completed they undertook the erection of the other buildings and finished them as rapidly as the scarcity of materials would permit, and were enabled to move in last September. The plan contemplated greater molding facilities, however, and a second foundry is now in process of construction. When the new foundry is completed the works of the company will be precisely as indicated on the accompanying ground plan. The plant comprises a main building, 79 x 259 feet; a power building, 67 x 72 feet; a japanning building, 51 x 70 feet; the No. 1 foundry, 72 x 402 feet; the No. 2 foundry, 116 x 402 feet; a pattern storage building, 30 x 72 feet; a pattern making and carpentry building, 33 x 108 feet; sand and coke shed and storage building for other materials, 26 x 90 feet. These buildings occupy only a portion of the ground owned by the company, ample room being provided for any enlargement which may be necessitated by the growth of the business.

In the construction of this plant it was the purpose of President A. J. Lindemann to secure buildings which would be as nearly fire proof as possible and which would arranged under the regulations of this association. A sprinkler system is installed on the top floor of the main building, which is the only part of the building in which such protection seemed to be desirable. A large reservoir is located on the grounds with a capacity of 125,000 gallons, from which a supply of water can be obtained for immediate use in case of necessity. In the engine room a large fire pump has been installed, manufactured by Fairbanks, Morse & Co., Chicago, for the purpose of pumping water from the reservoir to any part of the premises.

The topography of the ground on which this factory is located presented a favorable opportunity for such an arrangement of the buildings as would avoid the use of hoists in taking material to the charging floor of the foundry, and also would allow shipments to be made from the second floor of the main building and the japanning building. The ground is sloping, there being a difference in elevation of 12½ feet from the ground floor of the different buildings to the level upon which the railroad track runs. Materials for foundry use are thus stored on elevated ground, from which they are taken by means of a short bridge directly to the charging platform. For the purpose of enabling materials to be teamed through the yard with the least difficulty the driveways have been

paved with cement, which thus avoids all mud in winter and dust in summer.

The main building is four stories in hight. The front portion of the ground floor is used for office purposes, the space thus allotted being divided into several rooms, which are well furnished and have cement floors. Here are also located a laboratory, a well equipped room for hospital purposes, a drafting room and the usual lavatory, toilet rooms, &c. In the rear of the offices, but separated from them by a wide passageway, is the cleaning room for cleaning castings, which are brought here directly from the foundry. The tumbling barrels are of the most approved pattern, the dust being drawn from them by exhausters and deposited outside the building. A heavy press room is located in the rear, in which all shearing and pressing of sheet metal is done on heavy machines. These machines press sheet metal into shapes for ranges, gasoline stoves, &c., which are finished on the upper floors. The ground floor is further used for storing sheets, of which a very heavy stock is necessarily carried. This floor being on a lower level than the railroad track, the sheets are delivered into the storage room with but little labor by means of a chute. The second floor is largely used by the steel range department, illustrated in Fig. 2. Here the different portions of the ranges are assembled and mounted. On this floor is also located the nickel plating department, with which are connected the polishing and buffing rooms. The parts required to be nickeled pass through the hands of workmen at the polishing machines, next through the nickeling department, and are then buffed, after which they pass immediately into a storeroom, from which they are drawn to the several departments of the works as required. Exhausters are here provided for taking all the dust away from the polishing machines. On a level with this floor, in the rear of the building, is a long, covered shipping platform extending along the railroad track. The third floor is fitted with a very fine equipment for making parts of gasoline and oil stoves. Automatic screw machines, nut tapping machines, lathes, drills and other machines have been installed which are equal to a producing capacity of 400 gasoline stoves and 300 oil stoves daily. In connection with this shop is a large tool room equipped with modern planers, lathes, drills, &c., in which the company make their own tools and their own repairs. Portions of this floor are used for the purpose of testing the completed gasoline stoves and oil stoves. The testing departments are in constant use, a large number of benches being employed, which are filled with stoves as fast as they are completed, and the testing thus continues all day long. The fourth or top floor is fitted with special machines for the manufacture of stove pipe, elbows, roasting pans, portable ovens and heating stoves. The sheets required for these various purposes are stored in racks, in which the different sizes are assorted, and they are thus conveniently at hand as required. The company manufacture both corrugated and pieced elbows. The machines for this purpose are of the most modern pattern, enabling a large product to be turned out. Two large elevators connect all the floors of this building, one being located in the rear close to the shipping platform and the other on the side nearest the foundry. The walls of this building are designed to carry two more stories, should they be required.

Fig. 2.—Steel Range Department.

THE LINDEMANN & HOVERSON NEW FACTORY.

A bridge extends from the third floor of the main building to the japanning building. This bridge is 130 feet long, and is constructed wholly of steel with a cement floor. The japanning building is a three-story building, of which the top floor is used for the japanning ovens and the lower floors partly for storage and partly for shipping gasoline goods. In illustration of the completeness of the protection against fire, the fact may be stated that recently two barrels of the japan used in the japanning room ignited, but the employees simply closed

the windows and doors and waited on the outside for the fire to burn itself out. When they entered the room shortly afterward they found nothing but a slightly discolored ceiling to indicate that there had been a fire. This japanning department is of great capacity, containing five large sized ovens, with all the necessary racks and other appliances. So much of the work turned out by this company is completed with a japan finish that large capacity in this line is needed. City gas is used in operating the ovens.

The power house is divided into a boiler and engine room. The boiler room contains two 200 horse-power boilers, only one of which is needed at present in operating the machinery, the other being held in reserve. These boilers also heat the entire plant in winter, the steam passing to the detached buildings in underground pipes. Slack coal of the cheapest quality can be used under these boilers, which are fitted with hollow grates, manufactured by the J. L. White Furnace Company of Milwaukee. A small blower placed on top of the boiler forces air down a pipe through the grates, thus creating a forced draft whenever this may be needed for the purpose of securing better combustion. The engine room contains two engines, one of which is a Reynolds-Corliss of 150 horse-power and the other an Ideal of 100 horse-power. A fire pump is also located in this room, as previously stated. The engines operate Milwaukee Electric Company's dynamos, one being direct connected to the Ideal engine and the other operated by belt from the Reynolds-Corliss engine. All the power for the plant is here generated, motors being used in the different buildings or departments for operating the machinery.

The foundry buildings are light and airy. An interior view of the No. 1 foundry is shown in Fig. 3. The light is furnished both from the sides and through skylights in the roof. The character of the work turned out in these foundries is all small, no piece weighing more than 20 pounds; consequently no cranes are needed. Duplicates being constantly made, molding machines are largely used. The foundries are equipped with the Sly cinder barrel for saving the waste iron from cupola slag. Two cupolas are used, which are placed in a cupola room between the two foundries, so that both can be served from one charging platform. These cupolas are so placed that one faces each foundry. They are 72 inches in outside diameter and have a melting capacity of 15 tons per hour.

While the utmost care has been taken in designing and constructing the works to secure protection from fire and economy of operation, the comfort of the workmen has been equally the subject of solicitude. All departments are amply provided with lavatory and sanitary facilities, so that the workmen may have every convenience for cleanliness and personal comfort. It has been somewhat discouraging for the company to find that appliances of this kind have not been fully appreciated, but they propose to conduct a campaign of education and teach the workmen the necessity of using the facilities which have been provided. For the purpose of contributing still further to their comfort an arrangement is being made to provide hot water at all times, so that those who desire to use hot water for washing may enjoy this luxury.

The company have retained their building in the city, using a portion of it for their main offices and the remainder for storage purposes.

Fig. 3.—Interior of No. 1 Foundry.

THE LINDEMANN & HOVERSON NEW FACTORY.

The Ontario Power Company have decided to make their proposed big flume through Victoria Park, on the Canadian side at Niagara, of steel. This flume will extend from a forebay at the head of the upper rapids through Victoria Park, running along at the base of a bluff, and will be concealed. It will have a total length of 5880 feet, and will be 18 feet in diameter. The steel will have a thickness of about ½ inch, reinforced by heavy steel hoops. Temporary shops will be erected on the ground for its construction. It will be built by the Jencks Machine Company. The temporary plant will include power house, machine shop, boiler house, office and boarding house. About 200 tons of rivets will be used. A temporary railroad will be built along the route of the flume to handle the steel. It is expected that over a year will be consumed in its construction.

Superheated steam upon the Schmidt system is being installed upon many foreign railways, notably in the Prussian State railways, where there are 70 engines so fitted, and also in Italy, Russia and Belgium. In this country the Canadian Pacific and the Pennsylvania Railroad are building locomotives to use superheated steam.

Official Testing of Steel Tapes.

WASHINGTON, D. C., August 11, 1903.—The National Bureau of Standards is now prepared to compare steel and other metal tapes used in engineering, surveying and manufacturing with the United States Bench Standard, and is framing revised regulations for the testing of such tapes graduated into both feet and meters. The charges for this work are nominal, ranging from 75 cents to $2, according to the length of the tapes and the number of determinations desired. Manufacturers desiring to avail themselves of the facilities of the Bureau should observe closely the regulations in order to expedite the testing and return of such tapes as may be forwarded.

The total length and as many divisions as may be desired will be tested, the fee depending upon the number of divisions compared. In many cases it is sufficient to know the correction for the full length of the tape only. For measuring distances greater or less than the full length of the tape, it is unnecessary to test more than a few additional subdivisions. For example, any distance in even feet greater or less than the full length of a 100-foot tape may be accurately measured if the corrections are known for its entire length, for each 10-foot subdivision, and for each foot of the first five feet. The Bureau is not at present prepared to support tapes at intervals, and all comparisons will therefore be made for the present with the tapes horizontal and supported throughout their entire lengths.

In every case the party desiring verification of a tape must specify the exact number of comparisons desired, the points at which such comparisons are to be made, and also the tension to be used. For general purposes the test indicated above is recommended.

The National Bureau of Standards test number will be stamped or etched upon the tape if the total length is on a single piece of metal ribbon. A tape in which the initial mark is a wire loop or where the end mark is on a spring balance sent with the tape will not be stamped with the certificate number.

Tapes should be securely packed in cases or packages which may be used in returning them to the owner. In all cases transportation charges are payable by the party desiring the test and should be prepaid. Tapes are returned charges "collect" unless otherwise arranged for. Fees should be sent with the tape and should be remitted by United States postal money or express money order drawn to the order of the "Secretary, National Bureau of Standards." The following schedule of fees for verification of tapes has been established:

I.—Tapes Graduated Into Feet.

a	Determination of total length, not greater than 100 feet.	$0.75
b	For total length of 200 feet, including comparison of the 100-foot division	1.25
c	For total length of 300 feet, including comparison of 100-foot and 200-foot divisions	1.75
d	Each further subdivision compared	.10

II.—Tapes Graduated Into Meters.

e	Determination of total length of tapes not longer than 30 meters	$0.75
f	For total lengths over 30 meters and not greater than 60 meters, including comparison of middle point	1.25
g	For total lengths over 60 meters and not greater than 90 meters, including comparison of each third of total length	1.75
h	For total lengths of 100 meters, each 25-meter point also compared	2.00
i	Each further subdivision compared	.10

In addition to the above tests, determinations will be made of the length of tapes at additional tensions to ascertain the coefficient of elongation, and comparisons will also be made at different temperatures, if desired, in order to furnish data for the determination of the coefficient of expansion. The Bureau states that comparisons of a large number of tapes of various makes, covering a wide range of temperature, indicate that coefficients of steel tapes do not differ materially from that of the United States Bench Standard, viz.: 0.0000063 per degree F., or 0.0000114 per degree C., and for all purposes except the most refined geodetic work the above coefficient is sufficiently accurate. When a special determination of the coefficient is desired, a sufficient time must be allowed to secure the necessary range of temperature.

The certificate furnished by the Bureau of Standards will contain the following data: Description of tape; National Bureau of Standards number, where allowed; party for whom tape is compared; temperature at which the comparison is made; method of support of tape (which for the time being will be throughout the entire length); tension at which the tape is compared and at which it should be used; the corrected value of each space compared, at the standard temperature, which is 62 degrees F. for customary tapes and 0 degrees C. for metric tapes, values at other convenient temperatures being stated when requested; date of certification; the seal of the Bureau and the signature of the Director, and special remarks where necessary. W. L. C.

Unions in Butte.

In a highly interesting letter from the pen of Thomas F. Woodlock, editor of the *Wall Street Journal*, on Butte, Mont., we take the following:

As for the unions in Butte, so far as I could learn, the only industry which is not organized in the town is that of the newspaper reporters. I failed to learn of any other. As an example of the extent to which organization has been carried I may mention the fact that there are just 11 passenger elevators in Butte. The operators of these elevators are a union, which has affiliated itself with the Pin Boys' Union, these, of course, being attached to the bowling alleys. Messenger boys, barbers, waiters, women stenographers, butchers, stablemen—all have their unions and their ruler, their delegates and their officers, their contributions and their by-laws. No nonunion man has any right to stay in Butte if he wants to work, and none does stay long. Every one in Butte who works for a living carries a card from his union—or her union—for no card, no work. Take the Barbers' Union, for instance; no man can shave a customer in Denver without a card on penalty of a heavy fine for the boss who employs him. Now a card in the Barbers' Union costs $15. Suppose a barber who is broke comes to Butte. He cannot earn $15 until he has worked and he cannot work till he has $15. What is he to do? In practice he avoids Butte, and hence the Barbers' Union is not troubled with too much competition from the outside world, Q. E. D., the D. standing for desideratum. Butte is surely not the place for a "scab" seeking a health resort, or a job.

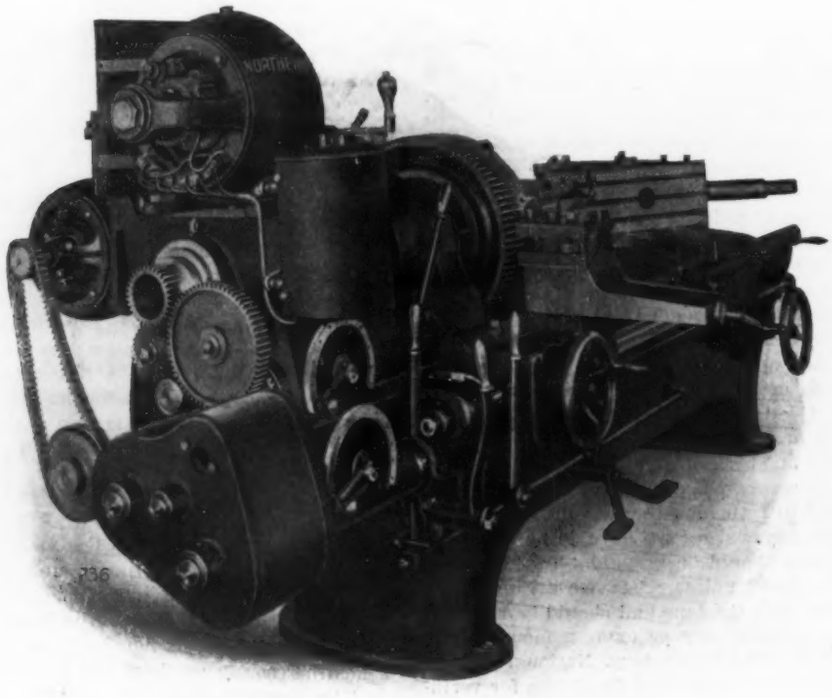
The powerful union is that of the miners, and it numbers probably 8000 to 9000 men. Of these perhaps 50 per cent. are Irish, and half the remainder are Cornishmen, the balance of the roll being of varied nationality. These are imposing figures, but as a matter of fact the Miners' Union is not especially strong, having been beaten some years ago in a strike, and probably being now about to undergo a cut in wages when the Amalgamated mines and new smelters (at Anaconda) open up again. The mines have now been closed for three weeks, and will likely be closed for five weeks more. The town is full of idle miners at present, and most of them have saved little or no money. Many will be hungry before the mines are again at work, and the impression is that the Amalgamated will take advantage of the opportunity to reopen only at reduced wages. This, however, is uncertain. The Amalgamated employ about 7000 men, against about 1000 employed by F. A. Heinze, but Heinze has made the rate of wages for all. This was one of his political strokes.

The unions in Butte vary their practice very much, one as compared with another. Some pin their faith to walking delegates; others, as the barbers, will take no action save by vote of the union. Some are prominent in politics as unions; others take no part collectively or as a body. The Miners' Union, for instance, is not, as such, in politics. It is conservatively administered by its leaders, and its members vote as they please. It may be said, moreover, that the strength of the individual unions in Butte is in inverse ratio to their aggressiveness. The Waiters' Union is now paying the penalty of too much greed. From 12 hours a day and $21 a week the union

thought it would like a change to eight hours a day and the same weekly pay. The employers are now using girls at $7 a week and eight hours a day, and the union will be beaten. Sympathy with unionism is not entirely as strong as it was when the police stood by, smiling and twirling their clubs, as the mob smashed the windows of the telegraph company whose messengers were on strike. Unionism is giving signs of having "run to seed" here and there—even in Butte.

Northern Motors Operating a Milwaukee Turret Lathe.

The engraving shows a 28-inch Milwaukee turret lathe operated by motors built by the Northern Electrical Mfg. Company of Madison, Wis. The motor driving the spindle is mounted on top of the head stock and is geared direct to the head stock mechanism. The motor controller is of the drum type and is located within convenient reach of the operator. The motor has 12 speeds ahead and 12 speeds reverse, with a range from 600 to 1200 revolutions per minute. The motor located at the rear of the head stock drives the traverse mechanism of the turret through a Renold silent chain. The entire arrangement is simple and effective, and greatly increases the capacity of the machine.



THE NORTHERN MOTORS OPERATING MILWAUKEE TURRET LATHE.

Fuel Oil.

At a meeting of the Mechanical and Engineering Section of the Franklin Institute of Philadelphia, John F. Rowland, Jr., spoke on fuel oil as follows:

Under the conditions of using a triple expansion engine, a horse-power hour may be obtained for a pound and a half of coal per hour, and if the boilers, engine and condenser be properly looked after, this result is continuously possible, using the average grade of either anthracite or bituminous coal. It may be either from the impossibility of using steam in this multiple expansion manner because of the smallness of the unit, or the undesirability on account of the difficulty or expense of obtaining condensing water, that power is had from the expansion of steam in a single cylinder without a condenser. The endeavor to obtain from this latter condition the best possible economy has resulted in the numerous devices for supplying coal to a boiler in a mechanical manner, both in the natural and pulverized forms. There has been supplied in the same natural manner another form of combustible than coal, which is the subject of this evening's discussion, viz., oil.

For many years refined oils have been used as fuel where the greater heat value alone determined the selection, but its use in large quantities where it has replaced coal is confined to such as is found in the natural state. There are about 19,000 heat units in a pound of oil, and about 12,000 available ones in a pound of coal. In comparing the two fuels, it is not alone the difference in heat value per pound that must be considered.

There are objections to the use of coal which would make oil the more desirable fuel if the heat values were the same, provided the cost of oil allowed the selection. In the ordinary way of firing coal there is the opening and shutting of the fire door with the constant change of temperature and the effect of this change upon the furnace, the combustion chamber and tubes in an internally fired boiler, and upon the shell or tubes in an externally fired one. It is from the effect of this change that most of the deterioration in boilers is due, and most of the expense of upkeep is entailed.

The deposition of soot on the tubes of a boiler constitutes perhaps the greatest heat waste in burning coal, and coal can hardly be burned in a manner to prevent this. Until the ashes from the burning of coal are removed from the vicinity of a boiler, there is a constant deterioration of any metal with which they come in contact.

It is possible, in burning oil, to dispense entirely with the temperature changes, there are no ashes to remove, and careful burning of the oil leaves very little unburned carbon. The burning of oil entails a minimum of expense for operating. The oil may be burned with the use of either steam or air, or a combination of the two, to atomize it and to provide sufficient oxygen for combustion. In selecting an oil burner that uses steam to atomize the oil, care must be taken that the quantity of steam be not too great a percentage of the total amount generated. If the plant where oil is burned uses pneumatic tools, it may be more advantageous to use air. Where a forced draft system of combustion is used, a combination of steam for atomizing and air for combustion may be used, and this combination gives results that have probably not been exceeded for economy.

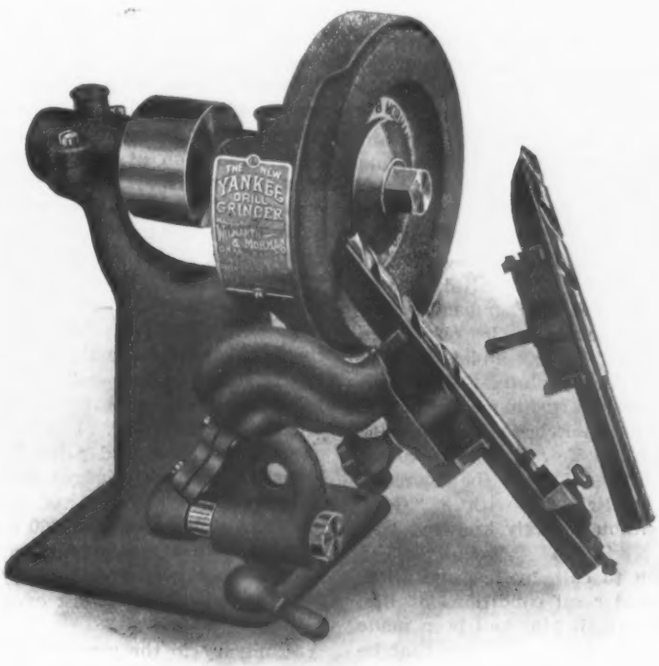
In a plant of over 4000 horse-power, using steam to

atomize the oil and air at a pressure of 3 inches of water for combustion, there is obtained regularly a net evaporation of 14.1 pounds of water from and at 212 degrees per pound of oil. The tubes are sponged in this plant once a month, as against every day when coal was used, and no repairs to furnaces or tubes have been necessary after seven months.

There is a considerable difference in the price of oil, depending on the distance it has to be carried, and while the price may be prohibitive where the distance is great, the fact remains that oil is largely superseding coal as a fuel, and when the economy of operation where oil is used has been continued for a sufficiently long time to have the results studied and diffused, there is no question but that oil will be still more generally used as a fuel.

Machine for Grinding Twist Drills for Wood Boring.

While the twist drill grinder has for many years been considered a necessity in metal working shops, it has only lately been introduced in wood working establishments. The grinder here illustrated, built by the Wilmarth & Morman Company of Grand Rapids, Mich., will grind these drills accurately and uniformly, and at the very sharp angle required for drills to be used in wood. The machine has two V-grooved drill holders, one for right, the other for left hand drills, both interchangeably fitted to the oscillating bracket. In operation the holder is swung to and fro while the drill is fed to the wheel by means of the feed nut on the tail stock spindle. Both cutting lips are ground to exactly the same length and angle, so that the work of cutting is equally divided between them, and the drill will do more and better work than when ground, inaccurately, by hand.



MACHINE FOR GRINDING TWIST DRILLS FOR WOOD BORING.

The machine shown is intended to stand on the bench or pedestal and to be belted to an overhead countershaft. It is also arranged to stand on the floor, with the countershaft contained in the base, so that it can be belted direct to the line shaft either overhead or below the floor.

It is possible that the Ruthenberg process for making steel by electricity will be given a commercial trial along the Niagara frontier. Rumor now couples it with a plant to be located on the Welland River not far from Niagara Falls. Several Canadian capitalists went to Syracuse recently, where Mr. Ruthenberg at present has his laboratories, and were favorably impressed with the process, and it is said decided to build a plant on the Welland River to thoroughly test the method, using Niagara Falls power for the purpose. Mr. Ruthenberg last summer read a paper on the manufacture of steel by the electric process at the meeting of the Electro-Chemical Society of America. Later he experimented at Lockport.

The Dover Forge & Iron Company.—The Dover Forge & Iron Company, Canal Dover, Ohio, have commenced to build their works at that point. They will manufacture bars for making roofing tin and galvanized sheets, to meet the growing demand for these products. The plant will contain muck and finishing rolls, steam hammers, charcoal knobbling fires, puddling furnaces and every accessory for making fine quality. The men to be employed will be carefully selected with a view to securing the services of only those who have had successful experience in the making of high grade English or Swedish bars. It is expected that the works will be in operation early in January. All contracts for machinery have been placed conditional upon prompt shipment. A. Beard is secretary and general manager of the company. He will personally supervise the operations, which will be confined exclusively to the manufacture of special tin plate and sheet bars and not to finished material.

The International Railway Company of Buffalo, N. Y., are to make extensive improvements and alterations in their motive power plants for operating their city and suburban lines, involving an expenditure of over $1,000,000. Niagara Falls power is used with auxiliary storage battery plants and supplementary steam plants for emergency use. About a year will be required to complete the new plants and equipment.

We are indebted to Eduardo Higginson of 10 Canute Road, Southampton, England, consul of Peru, for a map of the Republic of Peru issued under the authority of Don Engenio Larrabure y Unanue, Minister of Foreign Affairs. It is accompanied by interesting descriptive matter.

A Great Captain of Industry, John Ericsson.

BY EGBERT P. WATSON.

The dedication of a new statue to the memory of a great engineer, John Ericsson, in this city on the 1st inst., reminds me of many instances within my personal knowledge of him which reveal a side of his nature and disposition not generally known, but which should be to do him justice. For nearly 25 years I was favored with his friendship and had substantial tokens of it; this acquaintance came about through a combination of circumstances which were peculiar. By the chances of life it so happened that I drove the first bolt in the turret of the original "Monitor." I was then a machinist in the old Novelty Iron Works in this city, and having made a reamer for the bolt holes was ordered to go down and try it in the punched holes to see if it would fit. I did this and drove one of the bolts in to prove it. Shortly afterward I was invited to a position in the editorial office of the leading technical paper of the day, and in the course of work took occasion to comment favorably upon the "Monitor" itself.

This vessel had many enemies in high positions who lost no opportunity to depreciate her value to the country; her friends were few and far between, and Ericsson was grateful to any one who stood up for her. Up to within a few days of her trial I had never met Captain Ericsson, and was surprised to receive a note from his secretary asking me to call on him. Now at this juncture this was a very unusual thing; the country was in the throes of civil war, and every one was at the highest tension, Ericsson especially, for his reputation and fortunes were staked upon what might happen within a very few hours. That he should be capable of unbending for an interview with a total stranger, when he refused to see officials of high standing in the army and navy, was remarkable to say the least. The appointment was kept and a very brief one it was, merely rushing in and rushing out of the room upon Captain Ericsson's part, with a cordial grasp of the hand and a few words to express his obligations, and I found myself upon the doorstep, being literally thrust out by Ericsson with a "Good morning, sir, I am busy," without exactly knowing how I got there.

Thereafter I had occasion to call, by his invitation, many times, and saw him under all conditions of life, once when an attempt to blackmail him had been made by a fatuous reporter of a daily paper. To say that he was angry is a very mild expression; he was simply furious. The reporter had an article with him written by some one on the staff which he said Captain Ericsson might like to see before it was published; it raked the "Monitor" system fore and aft as a mere job to get the people's money. Ericsson read the article and then asked the reporter what it would cost to suppress it—to trap him. The reply was:

"One thousand dollars."

"Go and publish it, you infernal scoundrel; I do not care what you publish. I live for the truth, but you are an infernal liar; I will not have such a man in my house another moment; get out!"

I saw him just after this incident and he was still fuming from it.

This narrative, to be truthful, should record that this was frequently his mood, and he had much to make him so. He was by nature a most forceful man, combative and assertive to a marked degree; he was not diplomatic or reticent about anything; if he had an opinion he gave it in old fashioned Anglo-Saxon terms that left no doubt of what it was. Once when I supposed I had invented a desirable form of screw propeller he looked it over carefully, and then said: "It is not worth a damn." On another occasion, however, when I showed him a working model of a lever engine, a type he particularly approved of, he said it was excellent, very good indeed, and he would like to see it in action. He asked how fast the model had run (it was 4 feet long and 8 inches beam), and when I replied at the rate of three miles an hour for a short distance, he said: "My, my! You have done a great thing; I never could make a model go faster than one and a half miles an hour."

These incidents are not related because I happened to be an actor in them, but for the reason that they show Ericsson to have been fair minded and not incapable of seeing value in the ideas of others. This view is taken by many at this day, upon very slight evidence; he had a great deal of trouble with contractors, for all of his work was done by shops; he never owned one himself. Often when he was explaining his plans to superintendents and others, some one who had not given the machine the least study would suggest that some details should be changed, and then he would be furious indeed and utter very burning words; not without justification, perhaps, for a prudent man, wise in his day and generation, will not make suggestions to alter any one's plans without an invitation to do so.

It has been said that Ericsson had much to contend with in his surroundings and the chances of life; this is true, and it is not generally known that for his Monitor plans he never received one penny from the Government in any form, and all bills introduced in Congress to compensate him were killed by his enemies. It was the same with the United States steam vessel "Princeton," which was the first screw steam vessel of war owned by the Navy, and the pioneer in naval screw steamers, although the English naval steam vessel "Ranger" was built shortly after. Through the influence of naval officers of the period Ericsson was never rewarded for her plans and engines, which were a distinct innovation at that time. These things had their influence in a marked degree, and while he was a man who would not submit to an injustice if he could help it, in these instances he was powerless. Another incident which happened long after the civil war came about through the neglect of the managers of the Centennial Exhibition, in 1876, to invite Captain Ericsson to contribute a history of his inventions. He was greatly chagrined, but this could be remedied, and he set about it. It took the form of a large volume containing his principal engines and devices of every kind from the beginning of his career. It was profusely illustrated with costly engravings and printed on plate paper made expressly for it. The edges were gilded with pure gold, or 18 carat, at least, and bound in the best turkey morocco. This book cost $60 a volume or $60,000 for an edition of 1000 copies for complimentary distribution; none of them was ever sold by Ericsson. It was doubtless the most costly work ever gotten out in this country.

Contrary to the general opinion, Ericsson was not a rich man, and his secretary told me once that he never had an income until he was over 60 years of age; that came from his hot air engine, which was largely used, and is still in the market, for pumping. If he was nominally short of funds, there was certainly no evidence of it in his expeditures, for he was lavish enough in that direction, and his right hand never knew what was given away by his left.

One instance of his disregard for money is shown by an occurrence in the Morgan Iron Works, where he was having a surface condenser built. The casting was difficult to make by reason of its shape, and the foreman of the foundry wanted to leave it in the sand to cool before uncovering it entirely, but Ericsson was anxious to see it and ordered it dug out. It looked all right, and after a little badinage wth the foreman about his timidity Ericsson went away. The next day, however, told a different tale—the shrinkage had torn the casting in two and the foreman awaited his visit with anxiety. When he came and saw what happened he merely said: "Can you make another with what you know now?" "Yes, sir," said the foreman. "Go ahead then," said Ericsson. That condenser casting cost $1500 and the loss fell upon Ericsson. He did not make many mistakes, but, like all men, he made some. He did not put the blame for them upon others. In appearance Ericsson was of middle hight, but he had immense shoulders and chest, and must have possessed great strength; his countenance was stern and forbidding, but when pleased he could lighten up, and in that mood was a handsome man. In his youth he must have been very attractive indeed. Always when I saw him

his dress was immaculate black broadcloth, and he evidently had a partiality for brown windsor soap, for the odor of it was pronounced. In his ordinary moods he was a companionable man, saying what was to be said with few words, not sententiously, but with a fair vocabulary for a foreigner. He never quite got rid of his "burr," so to call it, but held on to his r's until they rang again. During the last 30 years of his life he lived at 36 Beach street, near St. John's Park, West Broadway, which was once a residential district of the city greatly affected by the older citizens. He disliked change so much that long after the park had been changed into the New York Central Railway freight depot he still remained. Upon either side of him were cheap boarding houses, French, Italian and German merchants in rags and bones, and quantities of wandering curs of low degree, so that there was "a general flavor of mild decay" over all. It seemed strange that he should reside in such a locality, but he lived and died in it.

The models of all his inventions were displayed in glass cases around the room, and they were beautifully made. Every detail was constructed upon a certain scale, and woe be to the model maker if he departed in the least from the drawing. He had to make good the least discrepancy and take a lecture besides. Ericsson was a fine draughtsman and never permitted any rule of thumb business in getting dimensions, one piece from another. He declared that all dimensions were on the drawings and the machine would go together all right if they were followed. He was never idle but always engaged in planning new departures in his profession. At 84 years of age he sent his secretary with some drawings to show me that his hand had not yet lost its cunning. They were surprisingly clear for a man of his years. Late in life he shunned all association with every one. He had become very deaf and was sensitive to his infirmity, but he did not forget anyone who had ever had his regard and confidence.

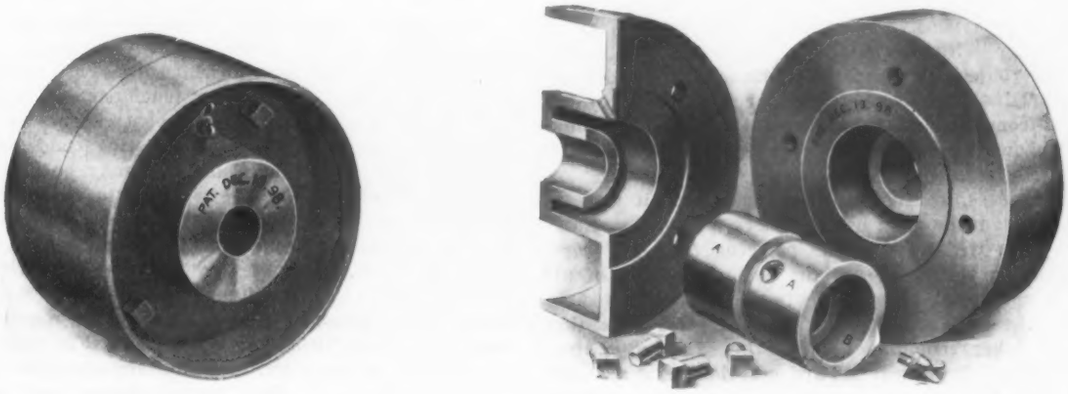
The Nelson Loose Pulley.

The loose pulley here illustrated is somewhat of a departure from the average attempt at producing a satisfactory device for the high speeds common in wood working shops. An unusually large amount of bearing surface has been provided. The sleeve fastened to the shaft provides for the bearing surface, not only by its increased diameter, but also by having in each end a bearing for the pulley. The ordinary loose pulley hub is too short and the diameter too small to provide sufficient surface to prevent the belt tension forcing the oil from between the surfaces. As, however, the oil is retained in any bearing by capillary attraction and forced out by the pressure on the bearing, it is obvious that there must be provided some means of producing sufficient capillary attraction to prevent the oil being pressed out; or, the attraction remaining the same, there should be provided enough bearing surface so that the pressure per square inch will be reduced to an amount where it is incapable of forcing out the oil. In this pulley the oil chamber is between the bearing surface and the shaft, so that centrifugal force assists lubrication, and as the higher the speed the greater this force, lubrication is greatest when most needed. The film of oil interposed between the bearing surfaces is so thick that at no time is there a metal to metal contact. These pulleys, which are made by the Wilmarth & Morman Company of Grand Rapids, Mich., are dust proof, so that the oil always remains clean.

Holthoff Machinery Company Purchased.

The negotiations just consummated by which Benjamin Guggenheim of New York and associates have purchased the Holthoff Machinery Company of Cudahy, Wis., are more interesting than would seem at first glance, for not only are the company assured of very substantial financial support but also a large amount of business. Mr. Guggenheim is a member of the firm of M. Guggenheim's Sons, who have immense mining and smelting properties in this country and Mexico, and it is stated that these interests are alone sufficient to utilize the present output of the plant. He is also president of the Loomis-Pettibone Gas Machinery Company of 52-54 William street, New York, who are to erect a very large plant in Linden township, near South Elizabeth, N. J., and to whom the Holthoff Company will hereafter be closely allied.

To provide for the increased business that will come through the influence of the new owners, the capacity of the plant at Cudahy is to be considerably enlarged, both by the erection of additional buildings and the installation of new machinery, none of which has been purchased. Details of these improvements are not yet available, and the character and amount of machinery that will be required are not yet known. While the manufacture of mining machinery is to be continued as the chief business at this plant, other lines may be taken up in the near future.



THE NELSON LOOSE PULLEY.

The Holthoff Machinery Company will occupy as their New York office part of the suite now occupied by the Loomis-Pettibone Company, and Cyrus Robinson, vice-president and general manager of the latter company, will be general manager of the former. He will be the engineer in charge of all important improvements.

As the Loomis-Pettibone Gas Machinery Company have not yet contracted for the equipment for their proposed new plant, the aggregate amount of machinery to be purchased by both companies is quite large, and it will not be amiss here to give a brief outline of the two plants.

The works of the Holthoff Machinery Company were first put into operation early in July of last year, and consist of a boiler shop, 100 x 250 feet; machine shop, 110 x 250 feet; pattern shop, 80 x 120 feet, and office building.

The plant of the Loomis-Pettibone Company will consist of a producer shop, 100 x 680 feet; machine shop, consisting of two buildings, 65 x 600 feet each; foundry, 112 x 500 feet; erecting shop, 40 x 150 feet, and pattern and storage house, 112 x 200 feet. The product will be gas engines in large units and gas apparatus.

The Molding Machine.*

BY S. H. STUPAKOFF, PITTSBURGH, PA.

General Characteristics.

The object of machine molding is to save labor, to increase the output of a foundry, to decrease the cost of production, to produce uniform and, if possible, better castings than can be produced by hand, and to employ the smallest possible amount of skill in those particular molding operations which comprise a series of ever repeated automatonous movements.

It is obvious that it would require a complicated mechanism to perform successively and successfully all the necessary operations to make a complete mold, even if it were only the mold of a simple pattern. And, in consequence, the general equipment of a foundry which accomplishes this object must be necessarily quite an elaborate and expensive matter. The majority of designs of molding machines run in this direction, whereas in most cases it would have been better if the energy expended had been directed to their simplification. Such tendencies lead to complications which are altogether unsuited for foundry practice; they meet with little favor, and machines built upon these principles are of short life. Only the simpler molding machines have a chance of meeting with more or less success, even if they perform but a few operations, providing they perform these well.

Many founders would be well satisfied if at least some of the more expensive operations could be performed satisfactorily with the aid of time saving machinery. With this object in view, some ingenious founder or molder originally devised a contrivance to withdraw his patterns from the mold by mechanical means. Accessible records show that this occurred at least during the first half of the last century. The next step was to employ stripping plates, and conjunctively therewith it was attempted to ram the mold by machinery. These two operations—*i. e.*, withdrawing the patterns from the sand and ramming the flask—are the basic principles of all molding machines. Some machines are constructed to perform the one, some to perform the other operation and still others combine both in the same apparatus. All subsequent improvements and additions and all variations and methods of construction are merely a matter of detail. However, it must be said that it is solely due to the judicious selection and arrangement of the very details and to the superior refinement and quality of workmanship employed in their construction that modern molding machines have actually become a success.

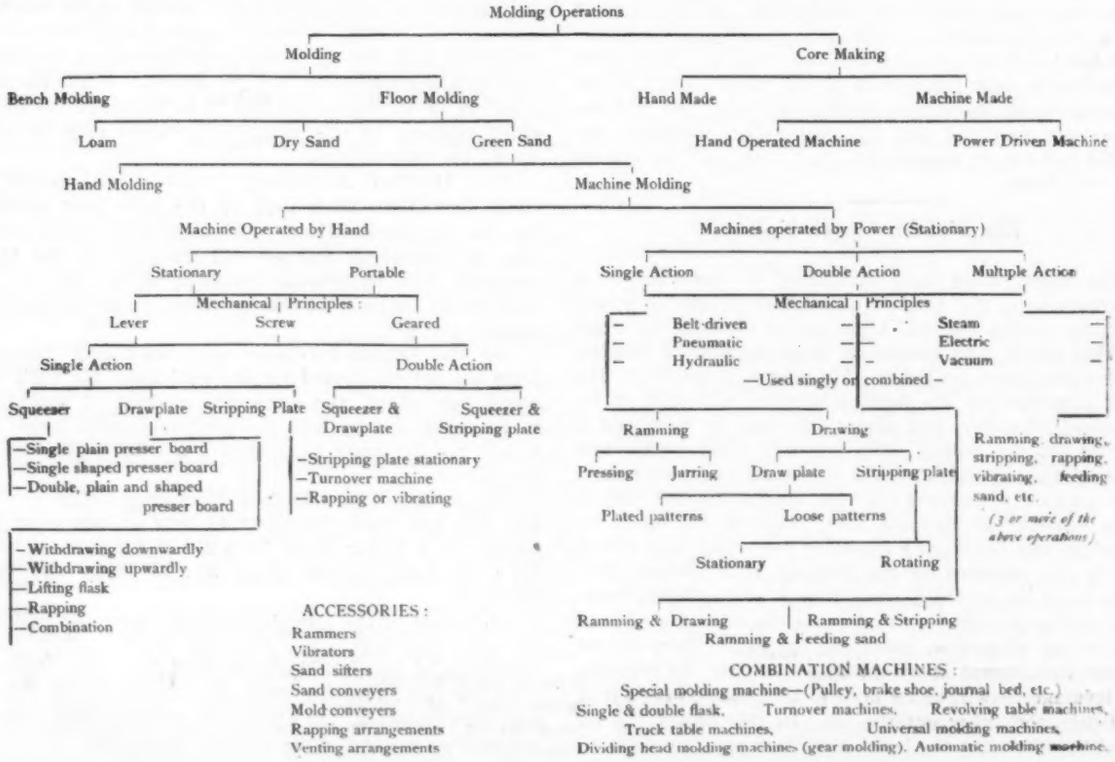
It would be idle to enter into a detailed description of the long series of schemes which have been suggested and which have been patented in this and in other countries. Some of them seem quite feasible and some of them have been successfully put in operation; but the majority are more or less impracticable and not worth the effort expended thereon. In the following only the type of each group will therefore be presented, and occasionally a description of the more important parts will be given, but we shall dwell at length upon the construction of those machines which have found favor with our foundrymen, and which, be it through merit or push, have found introduction and gained a strong foothold in many of our modern foundries.

Classification.

A systematic chart, such as shown, giving in a condensed manner the entire scope of the history and of past and present achievements of molding operations and molding machinery, will serve as the best means of representing this art in all its stages. It needs little or no explanation. An examination of its contents will not only show the functions of each individual class of machines, but it will also explain the gradual development and the relationship of the various contrivances. It may also aid to acquaint the reader with the extensive field of this branch of the industries, and, incidentally, it may enable him to form a fair idea of its future possibilities.

We observe from the accompanying chart that molding machines may be divided into two large groups, according to the manner in which they are operated—that is, in hand and in power machinery. The former may be made stationary or portable; each class being adapted to the peculiarities of existing conditions and requirements. Stationary machines may be distributed to good advantage along the walls or in rows along the aisles of a molding floor; quite frequently they may be secured to benches or posts or to the walls of the foundry. In other instances they may be advantageously provided with individual stands. The selection from these arrangements depends mostly upon specific circumstances, and little can be said against or in favor of one method or the other. Portable machines may represent the identical details of construction in their mechanism as stationary machines, but they are always provided with individual stands on wheels, which admits of their being easily rolled from place to place, following the sand heap and the flask pile on the foundry floor and leaving the finished molds behind them.

* Paper read before the American Foundrymen's Association, Milwaukee, Wis., June 9 to 11, 1903.



A good object lesson of the advantage of movable molding machines was given in a pamphlet by Henry E. Pridmore, wherein he explained that "for filling a foundry floor with 270 12 x 28 x 8 inch flasks by working either at the bench or with stationary molding machines, two molders would have to walk 7 miles and 720 feet, carrying a heavy flask over half the distance; while with the proper arrangement and with movable machine this distance was reduced to 6480 feet, or to about one-fifth of the above journey."

It is interesting to note that the quantity of molding sand alone in this case represented a mass equal in weight to about 20 tons, which remained practically at the same spot where used, while in bench molding or with stationary machines it would have to be carried over the given distance twice—that is, once from the floor to the bench before molding and once from the bench to the floor after molding.

This sounds like a strong argument in favor of portable molding machines. But let us sift the ground before we jump to conclusions. If the question were asked: "Are portable machines always applicable?" we must answer decidedly "No." In that case there remains nothing for us to do but to imitate Mahomet and go for the sand pile, if the sand pile will not come to us.

Portable machines are good in their place, but they are not good in all places. Molding machines can be made portable only in such cases where they are operated manually, and economy by portability decreases as the size and weight of the machine increase. Machines driven by power depend more or less upon fixed positions and cannot be moved about. It is of course an object well worthy of careful consideration in all cases to save time and labor in handling the molding sand, the flasks and the finished molds; but other means than portability on the part of the molding machines must usually be resorted to, to attain the desired results. We may find an opportunity to discuss them in one of the succeeding chapters.

Hand Presses.

The simplest form of all molding machines is undoubtedly the "squeezer." As its name implies, it serves the purpose of squeezing—not ramming—the molding sand into the flask. This object is accomplished by applying pressure to a plunger which is provided with a suitable press board and compacting the sand in the flask by this operation. Properly speaking, it is therefore a "plunger press," or a "plunger molding press."

The flask with follow or molding board and patterns is usually placed on a platen or table, and either the plunger is moved downward or the platen with the flask is moved upward. In exceptional cases the plunger or plungers move horizontally. Either one of these arrangements accomplishes the end, but satisfactory results depend largely upon the details of construction of the respective machines.

In most cases the pressure is applied by compound leverage, which, as a rule, admits of the simplest and most effective design. The moving portions of such machines, which are continuously exposed to the erosive action of the molding sand, and which, on this account, are subject to considerable friction and much wear, may therefore be made exclusively of pin connections. These are less expensive, and when worn easier replaced, than the parts of any other mechanical movement.

Hand Presses with Overhead Mechanism.

The most effective squeezer is one with the most powerful and most sensitive leverage, which requires little muscular effort and which confines the movements of the operator within a small compass. It appears, further, that it would be of best advantage to arrange all moving parts of a molding machine above the flask, as in this manner they will be removed from the direct influence of the sand. Such an arrangement would give little opportunity for wear and tear, few interruptions in service and a minimum of repairs.

This principle was followed in the construction of the post press, illustrated in Fig. 1, wherein the entire mechanism is arranged above the flask.

The leverage here consists of a toggle joint which is operated by toothed eccentric segments, as shown in Fig. 2. One of these segments forms an integral part of the combination counterweight and hand lever, and the second one is pivoted to the head of the plunger, which carries the press board at its lower end. Both segments are connected by a double link, which not only keeps the teeth of the segments in proper mesh, but which at the same time serves as a member of a toggle joint, of which the arm of the lower movable segment is the second member. The eccentrical arrangement of the gear segments imparts a quick movement to the plunger at the upper period of its stroke and multiplies the power applied at its lower period.

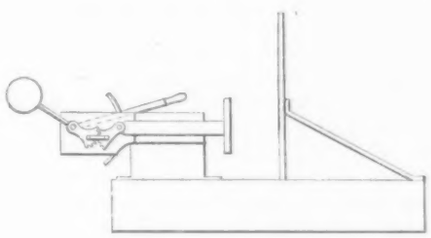


Fig. 1.—Post Press.

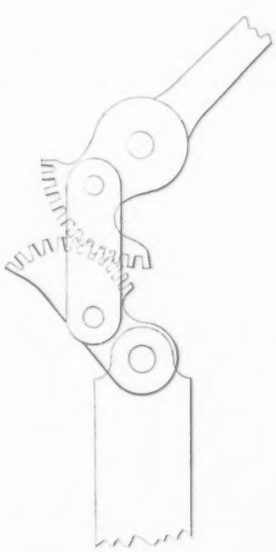


Fig. 2.—Toggle Joint.

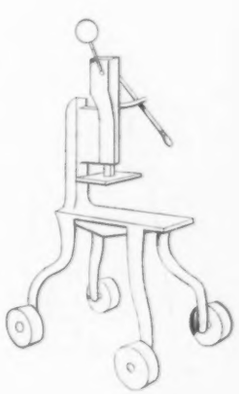


Fig. 3.—Movable Frame.

The mechanism is well designed, and comprises but few parts for the purpose it accomplishes. But it seems that the length of the stroke, depending upon the nature of this construction, is rather limited, and it is questionable whether the moving portions in spite of their dust proof covering are not subjected to the cutting action of unavoidable dust. This machine, as found in the market, is either secured to a stationary post, and in this case it is provided with a bracketed shelf below the plunger head, which serves as a support for the bottom or mold board and flask, Fig. 1; or it is mounted on a movable frame, as illustrated in Fig. 3.

Some of the various mechanical principles which have been suggested for hand presses of the same class, or hand squeezers with overhead mechanism, are the screw, the rack and pinion, the eccentric, the crankshaft, the cam, the single and the double toggle joint and the compound lever. All are connected or form part of a rod or plunger which carries a presser board at its lower extremity, and all serve for the purpose of depressing this plunger and for compressing the molding sand in the flask with the presser board. It is an easy matter to see the shortcomings of these devices. It is most important that a hand press of this class should combine with simplicity of construction, powerful leverage, quick action, adjustability and accessibility, that the moving parts should be subject to little wear, and that sand and dust should add but little to the frictional resistance.

Hand Presses with Underlying Mechanism.

A second group of plain hand presses embraces all machines which have their mechanism arranged below the table or flask, respectively. We meet here with numerous designs, which embody almost without exception the application of compound levers. Molding machines belonging to this class are operated in three different ways—namely, by forcing the pressure head downward, or by forcing the mold upward, or by moving both portions toward each other.

Economical reasons prescribe that the pressure head should only occupy its central position with regard to the position of the flask on the machine table during the performance of its function. At all other times it would act as an obstruction, and it should be taken out of the way during the placing of the flask on the machine, the filling of the same with molding sand and its removal after completion of the mold. This is accomplished by either pivoting the pressure head uprights to the base of the machine or by swinging the head horizontally in journals around a vertical post, or by sliding the table or the pressure head in guides in a straight line in one direction or the other. These three principles are illustrated in Figs. 4, 5 and 6, which require no further explanation.

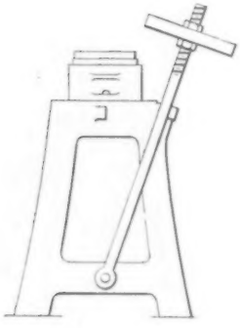


Fig. 4.

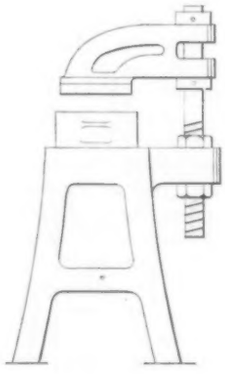


Fig. 5.

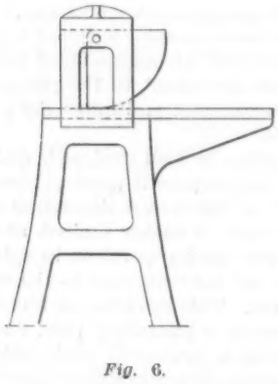


Fig. 6.

Position of the Pressure Head.

This movement ordinarily requires a special manipulation by the operator, which is not seriously objectionable, especially if the head is counterbalanced, be it by weights or by springs. The designers of some machines prefer to accomplish this movement by means of the main hand lever, which performs the act of pressing. And naturally, by doing it in this manner, it can be done only at the expense of the length of the stroke, which is thereby in some cases quite unduly increased. It is quite an important matter in hand operated machines that the length of the stroke of the main lever be kept within as small a compass as possible. By increasing it the bodily exertion of the operator will be increased likewise, and the output or the capacity of the machines will suffer materially.

Particular attention of designers, manufacturers or purchasers of such machines is directed to the importance of confining the motions of the operator within the smallest possible limits. He should remain permanently in an upright position; he should have no occasion to stoop or to excessively bend his body; he should be able to perform the bulk of his work by using only the muscles of his arms, adding thereto occasionally the weight of his body, if this should be necessary. If these rules are strictly followed, it is reasonable to suppose that the best possible results can be expected.

It is necessary that the distance of the pressure head from the table should be made variable, that it may accommodate itself to the hight of the flask, which varies with the particular piece of work on hand. This is easiest accomplished by means of adjusting nuts placed on the uprights above and below the pressure head, as shown in Fig. 4, or by raising and lowering the pressure head column in machines of a design as Fig. 5. Makeshifts, obtained by piling up additional boards on top of the pressure board, which practice is frequently resorted to, require too much handling, and are costly, uneconomical and unadvisable.

Machines with Movable Table.

Figs. 7 to 10 illustrate several types of levers applied to hand presses with underlying mechanism, which are operated by raising the table with the flask, in this manner forcing it against the vertically fixed pressure head. The drawings at the same time illustrate different modes of guiding the table in its support. The position of the pressure heads is indicated by dotted lines. Fig. 7 shows the positions of the mechanism in its normal

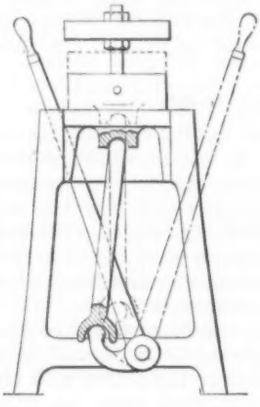


Fig. 7.

Fig. 8.

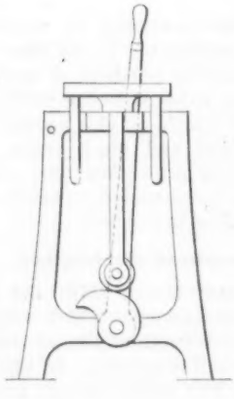


Fig. 9.

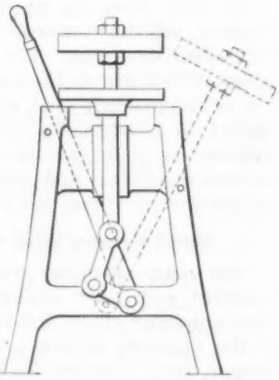


Fig. 10.

Types of Levers.

position in full lines and in its reversed position in dotted lines. The drawings, in which all details have been purposely omitted, are self explanatory; their object is to particularly show the manner of raising the table and flask by the reversal of the upwardly extending hand

lever, which is directly connected to a shaft that carries either cranks, levers, cams, eccentrics, pinions or any other suitable contrivance which engages with the downwardly extending shaft or stem, or shafts or stems, of the table.

Machines with Movable Pressure Head.

A second principle for applying pressure to the mold in plain hand presses is illustrated in Figs. 11 and 12, which show the usual method employed for pulling the head downward against the mold.

The pressure head uprights are in this case preferably arranged as in the foregoing, that they may be swung backward, and for this purpose their lower ends terminate in eyes which are movably fitted to pins. These pins, studs or shafts are arranged to slide vertically in slots or guides of the frames or standards, and they are either directly or indirectly connected to a hand lever. The normal position of the latter is toward the rear of the machine, and the upward or raised position of the pressure head corresponds with it, while its reversal causes a downward movement of the head, and upon application of muscular force a corresponding pressure upon the mold.

It will be observed that the arms of the knee lever

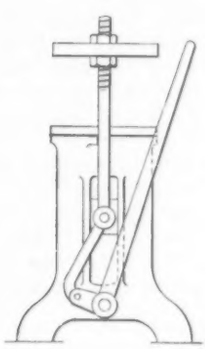


Fig. 11.

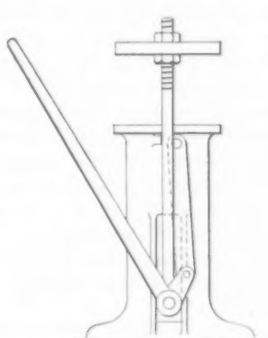


Fig. 12.

Pulling the Head Downward.

in Fig. 11 swing around a fixed center, which forms part of the frame work, and that in this case the end of the shorter arm is connected by a link to the base joint of the pressure frame, while in Fig. 12 the end of its shorter arm is jointed to a movable link, which is journaled at its upper end to the frame, whereas the boring at the apex of the angle engages directly with the pin of the pressure frame.

Other means are employed to accomplish the same results and to take the place of those which have here been shown and described, but they are mostly even more complicated and offer no additional advantage. As it is impossible to show everything in a paper such as the one now before you, it is hoped that the instances which have been cited may be accepted as a sufficient demonstration of the present case. Moreover there will be opportunities later on to show and to describe further mechanical movements in connection with other types of molding machines, which are applicable with equally good or bad results to those of simpler construction.

Machines with Double Function Hand Levers.

We will now turn our attention to Figs. 13, 14 and 15, which show the combination lever movements of a well-known molding machine, which combine the forward movement of the pressure head with its downward movement toward the mold. The arrangement of levers varies but little from those shown and described in the foregoing, but by securing the fulcrum of the hand lever above the fulcrum of the vertically movable pressure head uprights, and connecting its short angular arm to a link which engages with the uprights above the two mentioned fulcrums, an additional function of the leverage is attained. This acts so that the first portion of the stroke of the hand lever swings the pressure head forward, and in this manner brings it into a vertical position against a stop. A further movement causes it to descend vertically toward the table of the machine. A counterweight, acting upon a crank like bent shaft which is secured to the lower fulcrum of the pressure head up-

Fig. 14.

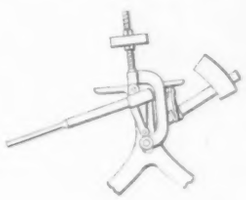


Fig. 15.

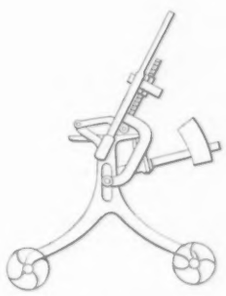


Fig. 13.

Machine with Double Function Hand Lever.

rights, assists in raising the head when the lever is reversed and in bringing it back to its normal position.

It is an unlucky coincidence that with this arrangement, at the very moment when the greatest power is required for compressing the sand, a part of it is spent to raise the counterweight to its uppermost position. This, however, is partly offset by the fact that at the end of this portion of the stroke the lever is in the most favorable position for the application of pressure, as the operator may use the maximum stress of his arm muscles, and add his own full weight to effect its depression. On the other hand, again, it should be noted that nearly 90 degrees or two-thirds of the entire stroke of the hand lever is required to bring the pressure head from the rear to its central position; and this is a proceeding which does not deserve particular recommendation. On the whole, however, it must be said that the combination of this leverage is an economical arrangement, which accomplishes its purpose without the expenditure of much power, and causes but little inconvenience and fatigue to the operator.

Figs. 16 and 17 illustrate the leverage of another style

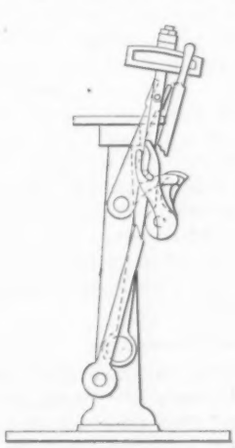


Fig. 16.

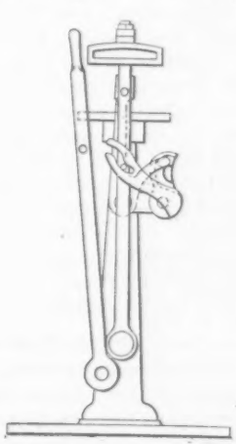


Fig. 17.

Hand Lever Independent of the Pressure Head Uprights.

of hand press which accomplishes the object just described, but in a different manner.

The hand lever of this machine is arranged independently from the pressure head uprights; both swing in in-

dependent centers; the hand lever engages with these uprights indirectly, by the interposition of supplementary levers, and such engagement continues only during the first portion of its stroke; it disengages after it has brought the pressure head from its normal into the vertical position; the pressure head is stationary with relation to the flask, while the table with the flask moves upward toward the pressure head, all of which is contrary to the arrangement as described in the foregoing. The supplementary levers are two armed; they are secured to the machine frame by studs which serve as their fulcrums. The end of one arm of each of these levers is slotted or fork shaped, and fixed studs or pins, placed in corresponding positions in the hand lever and in the adjoining pressure head rod, enters the slots. The second pair of arms of these levers is provided with a stud in one and a cam shaped groove in the other. Both are linked together by these means, and their relative position governs the position of the pressure head. The normal state of things is illustrated in Fig. 16, which shows the machine at rest, and the reversed state, showing the position of the levers after pressure has been applied, is given in Fig. 17. It will be observed that the engagement stud of the hand lever enters the open end of the slot in the fork shaped cam lever during its backward movement, and in following the curve of this slot it causes the pressure head upright to be forced backward. The hand lever engagement stud will rest at the lower end of the cam lever slot, and the table and flask will have returned to their original position of rest when the pressure head arrives at its final inclined position.

Objectionable Features.

A close scrutiny of the merits and demerits of this arrangement cannot fail to reveal the fact that the moving parts of this machine are too much exposed to the injurious action of spilled sand, and there is no possible way of effectually guarding against it. The slots and the groove in the cam have sliding faces, which are exposed, and which must be exposed to admit of a free ingress and egress of the engaging studs, and all these are open to the free access of dust and molding sand.

A combination of the mechanical movements of the main lever and the pressure head may appear at first sight as a preferable and superior arrangement. The simultaneous or connectedly consecutive movements of both, however, offer but little advantage in general. And should it be the case that the inappreciable gain be offset by other objectionable features, as by the troublesome task which arises from the compulsory frequent cleaning of moving parts and from subjecting these to excessive wear and tear, it would seem better and cheaper in the end to adhere to the simpler constructions, and move each portion separately and independently from the other.

These remarks should not be construed prejudicially against any particular construction; they merely express an impartial view of the subject, which is based solely upon facts and close observation. They may serve to throw light on some of the faults which are usually encountered in all molding machines, and they refer with equal force to designs as illustrated in Figs. 13 to 15, where exposed slots in the frame act as guides for the vertical movement of the pressure head. Though in this particular case a close fit is not very important, the necessary precaution should have been taken to prevent an accumulation of molding sand about the sliding portions as well as the bottom of the slots.

Scope of Plain Hand Presses.

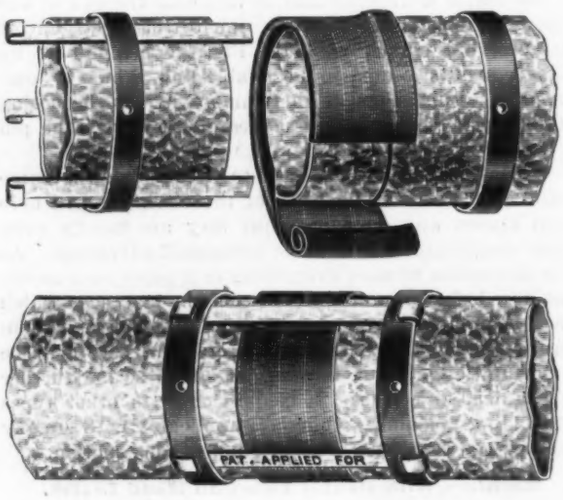
It requires very little reasoning to prove that the scope of utility of the described forms of "squeezers" encompasses but small limits, and that their successful application is strictly confined to the molding of shallow patterns. Unless in the case of deep patterns ordinary hand ramming and peining is resorted to at least for a part of the operation of compacting the sand the simple manipulation of the flat bottom pressure head will give but a poorly packed mold, which cannot possibly result in satisfactory castings. It is liable to give rise to all sorts of trouble. The casting may not come out true to size or true to pattern; it may be swelled and rough in one place and not run full in another; the molding sand which has not been rammed sufficiently hard in places may be washed off by melted metal, and as a consequence the casting may come out dirty and be unfit for use. Many other objectionable features may result, which would condemn not only the casting but also the molding machine itself.

It is well known that patterns of different characters require different treatment at the hands of the molder, and that it takes the combination of good judgment and skill only to be acquired by long practice to make molds of various intricate shaped patterns which will always produce good castings.

It is a grievous mistake to think that a molding machine of any description will replace a skilled molder. There is no less ingenuity required to produce good castings on a machine than to make them by hand. A molder is aided by his experience and by his good judgment; a machine hand (customarily selected from unskilled labor) has nothing to offer but his muscles and his good will. These qualities, however valuable they may be in some places, are at best but poor substitutes for the dexterity of an expert. This being the case, it is quite natural that under ordinary circumstances the chances are but slight to obtain good castings and good general results by mechanical means which are imperfectly understood and subjected to reckless abuse by hands which are unquestionably green in the business. And if it were for no other purpose than to avoid loss and failure, this should be sufficient reason to provide if possible the necessary means to counterbalance all, and where this cannot be accomplished at least the greater part, of the shortcomings of this method. Owners of molding machines should not expect marvels from an inert piece of mechanism; but it is safe to say that they will seldom fail in their calculations if they are satisfied with a reasonable increased production, provided they are willing to pay the best possible attention to their manipulation.

The Tallerday Sheet Steel Pipe Connection.

The sheet steel pipe made by the Tallerday Steel Pipe & Tank Company of Waterloo, Iowa, is either



THE TALLERDAY SHEET STEEL PIPE CONNECTION.

single riveted or lock seamed lengthwise of the pipe. The method of making the connection will be understood from the engravings. The cloth is cut long enough to wind three times around the pipe. Sufficient cloth to pass once around the pipe is dipped in melted asphaltum. After this has been applied the two sections are shoved together. The rest of the cloth is coated with asphaltum and wrapped tightly about the pipe. The clips are then put in place and their ends bent over the collars, as shown in the lower cut. This pipe can be attached to common iron pipe by the use of pipe nipples threaded at one end.

Production of Tungsten, Molybdenum, Uranium and Vanadium in 1902.

WASHINGTON, D. C., August 11, 1903.—The annual report of the United States Geological Survey upon the production of tungsten, molybdenum, uranium and vanadium for 1902, which has been compiled by J. H. Pratt, contains some interesting details with regard to the development of various deposits of these minerals, which are now being employed in the production of ferro-alloys possessing a wide range of characteristics. As the demand for these metals is not equal to the supply, prices have been lower throughout the year than in 1901. The outlook for 1903, however, is for a larger demand and a correspondingly greater production, with the prospect for a much more stable market value in the future.

Although it has been demonstrated that these metals have highly beneficial effects upon steel when used in its manufacture, considerable study of them is necessary before their commercial position with respect to one another or to nickel and chromium can be definitely determined. They offer an interesting field of investigation, from both a scientific and a commercial point of view, in regard to their relative value in the manufacture of tools and their effect upon different forms of iron to be used in various parts of machinery. Questions come up as to which of these various hardened irons are the best adapted for steel drills, for dies and shoes in stamp mills, jaws in crushers, rolls, car axles, carpenters' tools, &c.; as to which retain best the cutting edge; as to which will heat the least when in use, and as to which will make the toughest iron. These questions can be most satisfactorily answered by making comparative tests with the different alloy steels. A. B. Frenzel of Denver, Col., has offered prizes at a number of the schools of mines in the United States for investigations relating to these ferro-alloys, in respect of the questions raised above with regard to the physical and chemical properties of the alloys, with regard to the effect of the variation in amount of the hardening metal added and with regard to the methods of analysis.

Sufficient deposits of all these ores are known to supply any demand that may arise for them, so that at the present time it is not a question of supply, but of market.

Tungsten.

The production of crude tungsten ores during 1902 amounted to 183.5 tons, of which not more than a few tons were sold. This does not represent the amount of tungsten ore sold in 1902, for there were 76 tons of concentrated ore mined in 1901 that were sold in 1902. Some of the tungsten ore was put on the market in the crude state and some was concentrated to from 60 to 65 per cent. tungstic oxide. A product containing this percentage of tungstic oxide is valued at $2.50 to $3 per unit. In 1901 the production amounted to 179 tons of concentrated ore valued at $27,720. The larger part of the production of 1902 was from Colorado, with a smaller amount from Connecticut. There were no new localities developed during 1902, and all the production was from the old deposits. The use of tungsten steel is being introduced for steels in drilling, and it seems very probable that it will be found especially adapted for this purpose.

The Great Western Exploration & Reduction Company of Boulder, Col., the largest producers, placed some of their product on the market as concentrated ore and some as ferro-tungsten alloy. There were small amounts of tungsten ore (wolframite) and tungsten iron imported into the United States in 1902, which were valued, collectively, at $7046.

Molybdenum.

As a result of the many inquiries made for the ores of molybdenum there are a number of localities that have been developed in 1902, and preparations have been made to place their product on the market. The most work of this character has been in Washington County, Maine, where the American Molybdenum Company have been developing a deposit of molybdenite near Cooper. The company have erected a mill for treating the ore and expect to be in a position to ship the commercial product during 1903. The molybdenite is of good quality and is apparently in quantity. Although there are a number of other good deposits of this mineral in the United States, there was but little development work done on them, owing chiefly to the uncertainty of the market.

With the exception of a few tons mined for experimental purposes, the entire production of commercial molybdenite was by the Crown Point Mining Company of Seattle, Wash., from their property in the western part of Chelan County. This production amounted to about 12 tons, approximately the same as that of 1901, but none of the product was shipped in 1902. The value of these molybdenum ores is very erratic, the highest price quoted being $1500 per ton and the lowest $100. It is very probable that with any constant demand for these ores they would be furnished in quantity at a price varying from $100 to $200 per ton for a 50 to 55 per cent. ore.

Uranium and Vanadium.

There has, perhaps, been more progress in the development of deposits of minerals containing uranium and vanadium during 1902 than of those containing tungsten or molybdenum. A. B. Frenzel of Denver, Col., has been carrying on extensive development work on the deposits at La Salle Creek, southwest of Paradox, Montrose County, Col. The demand has increased for these metals for use in the manufacture of ferro-uranium and ferro-vanadium alloys, and also for the manufacture of salts of these metals. Promising deposits of vanadinite, the vanadate of lead, have been found during the last year in Arizona, and are now being investigated by Mr. Frenzel, who states that he has perfected a process for the extraction of vanadium oxide from these ores.

There was a marked increase in the production of uranium and vanadium minerals in 1902, which, as reported to the Survey, amounted to 3810 tons, valued at $48,125, or $12.63 per ton. This of course represents the crude ore. In 1901 the production was 375 tons of crude ore. A portion of the uranium ore was treated, giving a concentrated product of 25 tons, which was valued at $8000, or $320 per ton. What percentage of uranium oxide this concentrated ore contained is not known. The crude vanadium ore, of which there were 3000 tons produced, contained from 2.5 to 4 per cent. of vanadium oxide, and the crude uranium ore from 2.5 to 5 per cent. of uranium oxide. All of this production was not sold in 1902. It consisted principally of the mineral carnotite, with smaller amounts of uranite (pitch blende) and vanadinite.

W. L. C.

The Iron and Steel Institute.—Among the papers to be read at the Barrow meeting of the Iron and Steel Institute are the following: "Alloys of Iron and Tungsten," by R. A. Hadfield, vice-president; "The Restoration of Dangerously Crystalline Steel by Heat Treatment," by J. E. Stead, member of council, and A. Windsor Richards; "Sorbitic Steel Rails," by J. E. Stead, member of council, and A. Windsor Richards; "The Rolling of Large Pipes," by R. M. Daelen; "The Regulation of the Combustion in Coke Oven Practice," by D. A. Louis; "The Fuel Used in the Barrow-in-Furness District," by W. F. Pettigrea; "The Diseases of Steel," by C. H. Ridsdale.

The Philadelphia Molders' Settlement.—Following a two days' conference in Philadelphia, between representatives of the Molders' and Coremakers' Union of North America and the National Founders' Association, it was announced Friday night at a mass meeting of the molders and coremakers that the demands of the men for shorter hours and more wages had been granted. In addition to this the employers, in recognition of the action of the molders in not going on strike, pending a settlement of their demands, have granted the latter a bonus of 10 cents a day dating from June 3 and ending August 7. The bonus amounts to $5 for each man. Twelve hundred men are affected by the new order, and, in all, about $6000 will be given by the employers. In substance the agreement is this: Beginning Monday, August 10, the molders and coremakers will work nine hours a day at the present rate of wages, $2.90. Furthermore, an increase of 10 cents a day, making the minimum scale $3, will go into effect June 1, 1904, thus making the agreement last two years. Besides this, the bonus was granted.

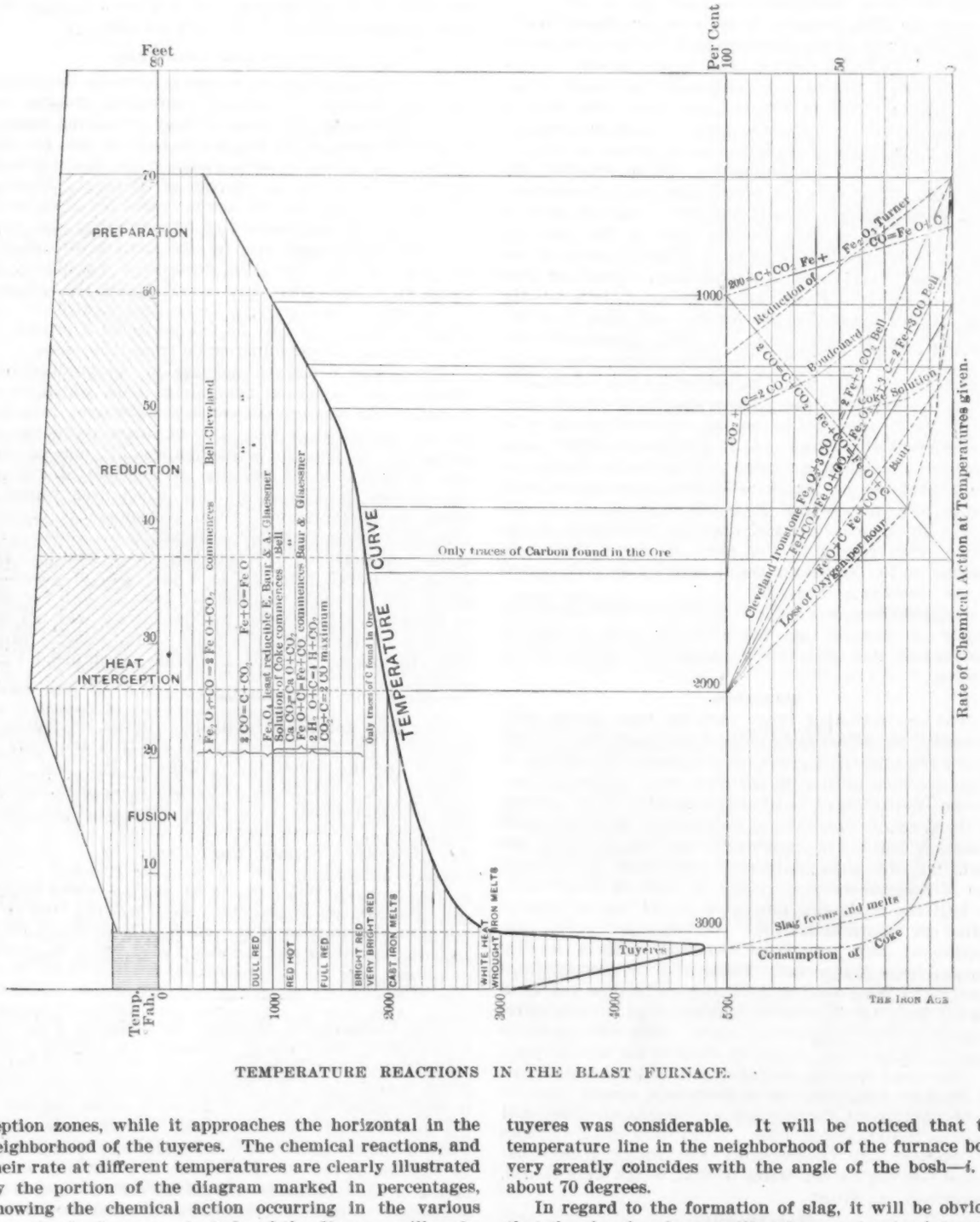
Temperature Reactions in the Blast Furnace.

BY HORACE ALLEN.

The accompanying diagram, showing the temperature variations which occur in a blast furnace, will be of interest to furnace managers and others who are engaged in the manufacture of pig iron.

The temperature line, showing as it does the gradual increase of temperature through the zone of preparation and into the reduction zone, will be observed to descend almost vertically through the reduction and heat interception zones, while it approaches the horizontal in the neighborhood of the tuyeres. The chemical reactions, and their rate at different temperatures are clearly illustrated by the portion of the diagram marked in percentages, showing the chemical action occurring in the various zones in the furnace. A study of the diagram will make it apparent that it will be almost constant for any blast furnace, although it has been constructed chiefly on results obtained from Cleveland ore smelted with coke fuel and limestone flux.

It will be readily understood that any change in the proportions of the blast furnace, the quantity and pressure of the blast, the temperature of the blast, or the hight of the furnace, will have no very considerable effect upon the curve showing the temperature in the different zones and the chemical action taking place, other than extending or reducing the hight to which it attains. An increase in the hight would have the effect of generally raising the temperature curve rather than reducing the temperature at the top of the furnace, while increasing the diameter would provide only a longer time for the materials to occupy the increased space, with possibly no increase in the efficiency of the chemical operation. A double row of tuyeres—*i. e.*, one row placed above the other—would have the effect of admitting a greater volume of blast; but, owing to the rapid reduction of heat, the temperature curve in the zone of fusion would not be greatly affected unless the difference in the hight of the



TEMPERATURE REACTIONS IN THE BLAST FURNACE.

tuyeres was considerable. It will be noticed that the temperature line in the neighborhood of the furnace bosh very greatly coincides with the angle of the bosh—*i. e.*, about 70 degrees.

In regard to the formation of slag, it will be obvious that the slag forming constituents cannot enter into combination until such a high temperature, associated with the intermingling of the elements, is attained as will permit the chemical combination to take place; so it is probable that most of the slag is formed in the neighborhood of the tuyeres. In the interior of the furnace the lime flux and silicates do not enter into combination until a very high temperature has been reached. This is largely due to the fact that the slag forming constituents are more or less widely separated during the descent of the furnace burden, only becoming intermingled where the

carbon in coke is consumed, the lime for fluxing being generally in pieces of considerable bulk which do not come into intimate contact with the silica, &c., until the hottest portion of the furnace is reached.

The temperature curve clearly shows the rapid increase of heat intensity in the hearth of the furnace, and indicates the portions of the brick work which chiefly require protection by water cooling, &c., while the very intense heat in the neighborhood of the tuyeres explains the necessity for the application of water to prevent the melting of the blast pipe and the fluxing of the adjacent brick work. It will be obvious that loss of heat by radiation from the exterior of the furnace will be greatest at the lower part of the stack.

Sir I. L. Bell has shown that some varieties of coke are more readily acted upon than others in the matter of solution by carbonic acid gas, which will explain why in some instances it has been found that increasing the volume and pressure of the blast supply has not resulted in economy and increased output of iron through a more active solution of coke by the CO_2.

The diagram will also explain the reason why the quality of the iron is affected by allowing the stock to fall too low at times. While the temperatures in the heat interception and fusion zones will remain constant, it will be apparent that the volume of the zones of preparation and reduction will be considerably curtailed and the average chemical action departed from, a higher proportion of the oxide of iron having to be reduced by solid carbon instead of by carbonic oxide gas, through the curtailment of the reducing zone.—*The Engineer.*

Norcross Brothers.

The committee of the creditors of the Norcross Bros. Company of Worcester, Mass., which corporation recently went into the hands of receivers, have submitted a plan of reorganization to the creditors, which, as far as can be learned, has met with favor among those to whom the company and O. W. Norcross, as an individual, are indebted. The committee, consisting of Francis H. Dewey and James P. Hamilton, representing Worcester banks; Neil Rantoul of F. S. Mosely & Co. of Boston, and Herbert J. Wells of the Rhode Island Hospital Trust Company of Providence, R. I., recommend in a circular letter that two corporations be formed, one to be called the Construction Company, whose function it will be to work out all existing contracts and continue the business generally; the other, to be a holding corporation, to own all the stock of the Construction Company and to apply their earnings to the payment of the interest on, and for the liquidation of, bonds to be issued to the creditors in payment of their claims against the Norcross Bros. Company and O. W. Norcross. The holding company, under the plan as submitted, will be known as Norcross Bros., Incorporated.

The Construction Company will retain of the existing assets, providing, of course, that the plan of the committee be accepted by the creditors, these items:

Worcester shop (equity)	$50,000.00
Inventory of equipment	190,854.48
Brick from New England Brick Company	30,000.00
Office furniture, &c	4,757.60
Cash in banks and office	23,389.11
Notes receivable	4,850.00
Accounts receivable, due on contracts in progress	652,763.37
Accounts receivable, due on contracts and work completed	296,942.68
Open accounts	12,000.00
Total	$1,265,557.24

and all contracts and good will of the business. The services of O. W. Norcross will be secured to the company for a term of at least five years, at a reasonable salary.

Norcross Bros., Incorporated, will take all other assets and all the individual estate of O. W. Norcross, excepting the home properties of the Norcross family, which will be conveyed to Mrs. Norcross in consideration of release of her dower interest in other real estate. This new corporation will issue negotiable 6 per cent. five-year bonds, secured by mortgage, to an extent approximating the amount of the present obligations of the Norcross Bros. Company and O. W. Norcross. These bonds to an amount sufficient to secure the release of indorsements by the Norcross Bros. Company and Mr. Norcross of paper other than their own will be placed in the hands of five trustees, to be elected by the bondholders. The trustees will hold all the stock of the Construction Company, the dividends, together with all money received in liquidation of any assets and all earnings of Norcross Bros., Incorporated, to go semiannually toward retiring the bonds. Holders of unsecured paper of either Norcross Bros. Company or Mr. Norcross will receive bonds at par to the amounts of their claims. Holders of secured paper will receive bonds for the balances of their claims after the sale of collateral. Merchandise and other creditors are given the option of the bonds in full payment of claims, or of 75 per cent. in bonds and 25 per cent. in 6 per cent. extension notes of the Construction Company on one year's time.

In this manner it is believed that the Norcross business will be continued without material hindrance and under the management of Mr. Norcross. There appears to be no doubt that had it not been for the serious labor troubles among the building trades, especially in New York, the corporation's affairs would have run along smoothly enough.

The creditors have also been asked to consent to the immediate completion of the new Harvard Medical School buildings, the contract price of which is $1,770,000, which will pay a profit of at least 10 per cent., besides effecting the sale of a large quantity of raw material.

The Forter-Miller Engineering Company.—The Forter-Miller Engineering Company, engineers and contractors, Westinghouse Building, Pittsburgh, are receiving a large number of orders for their Forter water sealed gas producers. They have just completed the erection of a battery of 22 of these gas producers at the new open hearth steel plant of the Alabama Steel & Wire Company, at Ensley, Ala., and have orders on hand for a number of them from the Latrobe Steel Company, Latrobe, Pa., the Inland Steel Company, Chicago, and the N. & G. Taylor Company, Cumberland, Md. The Lorain Steel Company have adopted the Forter water sealed gas producers for their new tube plant at Lorain, Ohio, and have placed an order with the Forter-Miller Engineering Company for 37 of these producers. The company are building at present a number of open hearth furnaces and heating furnaces for the American Tube & Stamping Company, Bridgeport, Conn; the Passaic Steel Company, Paterson, N. J., and N. & G. Taylor Company, Cumberland, Md. They have also a contract on hand for some bridge abutments for the Pittsburgh, Toledo & Western Railroad, containing a large amount of concrete work.

The Lincoln-Williams Twist Drill Company.—The Lincoln-Williams Twist Drill Company is the name of a new corporation who will manufacture twist drills at Taunton, Mass. They are incorporated under Massachusetts laws, with a capital stock of $25,000. The officers are: President, Alfred L. Lincoln of Taunton; treasurer, James H. Ball of Boston; secretary and superintendent, Edwin O. Williams of Taunton. The three officers constitute the board of directors. The company are now building special machinery for their machine shop, the location of which has not been determined further than that it will be in Taunton, and probably in a building to be owned by the company. A standard line of twist drills will be manufactured. Mr. Lincoln's name has been long connected with the twist drill business.

Judge Schuyler of Easton, Pa., has issued an injunction restraining members of the Molders' Union from interfering in any way with the employees of the Easton Mfg. Company. A strike is in progress at the Easton works and members of the union are alleged to have used their influence to keep nonunion men away from the plant. The strike is the result of the refusal of the Molders' Union to give bond to faithfully carry out an agreement with the company to work continuously for one year in return for an advance of wages.

The Republic Iron & Steel Company.

The Semiannual Report.

The Republic Iron & Steel Company have issued a semiannual report, which is introduced by the following statement by Alexis W. Thompson, the president, dated July 31, 1903:

The statement herewith presented of the operations of your company for the six months ended June 30 gives evidence of another prosperous fiscal period in the life of our corporation. The net earnings amount to $1,356,777.22, leaving a surplus (after the payment of $714,591.50 in dividends) of $642,185.72. When added to the surplus acquired up to January 1, 1903, the total surplus accumulated up to July 1 of this year is $3,248,206.28.

In arriving at the result for the last six months liberal amounts have been deducted from the profits realized on account of depreciation, such deductions including allowances both for all amounts expended for reconstruction, renewals and repairs, and for those set aside as an extinguishment fund for the ore and coal consumed out of our holdings, and also for the value of the rolling mill dismantled during the fiscal period just elapsed.

The amount shown in the balance sheet as the value of the inventories of raw and finished materials was ascertained, as to the largest part thereof, by determining quantities by actual weight and count, and by figuring values in every instance below the market at the date of this report. The fact that the sum represented by the inventories is somewhat larger than six months ago is solely due to an increased stock of steel billets to supply our finishing mills, necessitated by the temporary closing of our steel plant at Youngstown for the purpose of installing two 10-ton, in place of two 5-ton, converters, and a new 40-inch train of rolls with new reversing engines. These new converters, trains of rolls and engines were all completed and on the ground when the steel plant suspended operations on the first day of July, and in the month of August our steel plant will resume its work with a capacity increased to 1500 tons per day.

Ever since the organization of this company it has been the constant aim of the management to increase and improve their producing efficiency, particularly in the lines of ore, coal, coke, pig iron and steel. The extensive new work done in the Birmingham district, together with the cost of the new steel plant, and of the new continuous mills at Youngstown; of additional coke ovens; of the acquisition and development of ore and coal properties; of extraordinary replacements at rolling mills and blast furnaces, &c., &c., consumed the sum of $6,066,602.97, shown in the balance sheet as disbursed for "New Construction" during the last four years. Of this sum almost two million dollars ($1,918,325.19) have been expended in the Birmingham district alone for the erection of our new No. 3 Pioneer furnace, and of coke ovens; for the opening of ore and coal mines; for several hundred new houses; for locomotives, railroad tracks, switches, &c. The wisdom of this investment is shown by the fact that the net profits derived from the Birmingham district exceed the total amount there expended for new construction. The new (No. 3) blast furnace produced during the year last past (July 1, 1902—July 1, 1903) 80,202 tons of pig iron, almost equal to the combined product of Pioneer furnaces Nos. 1 and 2, and at much lower cost. Pioneer Furnace No. 2 was blown out April 1 in order to increase its capacity up to that of No. 3. This work is now completed, and during the next few months Pioneer Furnace No. 1 will undergo the same change. All of the Northern furnaces have been very recently relined and are good for continuous operation for from two to three years, with only ordinary repairs, for which, as well as for relining, a provision fund is charged into cost.

By this expenditure of $6,000,000 for new construction your company have been advanced to a position of increased strength in the quantity, and of reduced cost of manufacture, of their output; and for that reason, as well as for the fact that they are free from bonded indebtedness, they are well able to maintain an independent position, even in case they should ever have to meet a period of adverse general conditions.

Our holdings of raw material have again received substantial additions during this fiscal period. Under a favorable lease we have added 1,000,000 tons of desirable ore, and, through one of our subsidiary companies (the Connellsville Coke Company, the entire capital stock of which is owned by this company) 1200 acres of additional coking coal were acquired on favorable terms.

Starting out with a Northern ore supply of only 2,500,000 tons, and with a coal supply of 1,500,000 tons—barely sufficient for the operation of our Northern blast furnaces for five years—the company now command a supply of over 20,000,000 tons of the best grades of Northern ore, and of 14,000,000 tons of Connellsville coking coal, sufficient for the requirements of our Northern blast furnaces, producing 1000 tons of pig iron per day, for a period of 35 years. A large proportion of these ore properties are held in fee, and the remainder under very favorable leases, or under term contracts, and we are now mining all our requirements. They are all maintained in excellent physical condition and are equipped with the latest improved mining machinery. In addition to the coking coal, the company own in fee 1868 acres of steam coal in the Pittsburgh district, sufficient to supply our works in the Valley district with steam coal for at least 40 years. In Alabama the company mine all their coal, ore and limestone, owning a sufficient acreage of ore and coal lands and of limestone, almost entirely in fee, to cover the requirements of our Southern furnaces and mills for more than 50 years, and they manufacture all of their coke from a battery of 910 ovens, located at their furnaces. Being so amply provided with raw materials, further expenditures in this direction appear to be unnecessary for a long time to come.

In addition to these acquisitions of raw materials the company have increased their productive capacity since their organization by the erection of a steel plant, of modern continuous mills, and of a new blast furnace in the South, and by improving the other blast furnaces so as to increase the blast furnace capacity (North and South) from 400,000 to 600,000 tons annually. Of the original 28 rolling mills, five have been dismantled and the value thereof, less the salvage, written off to profit and loss, while the rolling mills which we are operating have been generally improved and maintained in the very best physical condition. All this has been accomplished in but a little more than four years, without the acquisition of new capital and after the payment of $5,694,353 in dividends to the stockholders.

The total shipments during that period (not including the transfers of ore and other material to our own works), amounted to $101,962,924.84, an average annual business of approximately $25,000,000, in the transaction of which the losses from bad accounts amounted to only $13,100.36, equal to but a trifling fraction of 1 per cent.

In the management of the company we were fortunate in enjoying the most complete harmony and co-operation and in the relations of this company to their labor the few small differences which did arise have all been amicably adjusted. With orders on our books on July 1 engaging our capacity for several months, and with the condition of the company strengthened as set forth, we feel justified in looking confidently into the future.

The following is the profit and loss account:

Profit and Loss Account

For the six months ending June 30, 1903.

Profit from the business of the company, after deducting all expenses, excepting improvements, renewals and repairs		$2,031,612.64
Less depreciation:		
Including amounts expended during the six months for reconstruction, renewals and repairs	$601,798.18	
Value of dismantled plant, less amount of salvage realized	73,037.24	
		674,835.42
Net profits during the six months		$1,356,777.22
Deduct two quarterly dividends, Nos. 15 and 16, of 1¾ per cent. each, on the preferred stock outstanding, paid on April 1, 1903, and July 1, 1903		714,591.50
Surplus for the six months in excess of dividends on preferred stock		$642,185.72
Surplus January 1, 1903		2,606,020.56
Surplus June 30, 1903		$3,248,206.28

The balance sheet as of June 30 shows the following assets.

BALANCE SHEET, JUNE 30, 1903.

Assets.

Real estate, plants, buildings, machinery and other permanent investments		$40,708,480.53
New construction:		
May 1, 1899, to June 30, 1900	$1,218,203.44	
July 1, 1900, to June 30, 1901	1,164,175.26	
July 1, 1901, to December 31, 1901	1,236,231.49	
January 1, 1902, to June 30, 1902	766,952.46	
July 1, 1902, to December 31, 1902	897,137.30	
January 1, 1903, to June 30, 1903	783,903.02	
		6,066,602.97
Stocks in sundry companies at cost		486,318.07
Producing oil and gas wells, pipe lines and leases		144,359.85
Prepaid royalties on ore and coal, and prepaid insurance		301,957.26
Inventories of raw and finished materials		4,614,739.43
Accounts and bills receivable		3,379,615.57
Cash		857,495.68
Total		$56,559,569.36

Liabilities.

Capital stock issued:		
Preferred	$20,852,000.00	
Less in treasury	435,100.00	
		$20,416,900.00
Common	$27,352,000.00	
Less in treasury	161,000.00	
	27,191,000.00	
		$47,607,900.00
Accounts and bills payable		4,931,556.44
Preference dividend No. 16 (paid July 1, 1903)		357,295.75
Reserve for depreciation of ore and coal mines		201,331.06
Reserve for taxes and insurance		144,378.62
Reserve for possible loss in collection of outstanding accounts and bills receivable		68,901.21
Profit and loss account:		
Net profit during six months	$1,356,777.22	
Deduct two quarterly dividends of 1¾ per cent. each, on preferred stock	714,591.50	
Surplus created during the last six months, in excess of dividends on preferred stock	$642,185.72	
Add surplus at January 1, 1903	2,606,020.56	
		3,248,206.28
Total		$56,559,569.36

There are issued $20,852,000 of preferred and $27,352,000 of common stock, of which $435,100 and $161,000, respectively, are in the treasury.

The Swedish mineral statistics for 1902 have been issued by Professor Akerman. The iron production comprised:

	Tons.
Iron ore	2,896,616
Charcoal pig iron	538,113
Blooms	186,076
Bessemer ingots	84,014
Open hearth ingots	201,311
Crucible ingots	1,091
Bar iron and steel	173,521
Rods, hoop iron and steel	68,490
Wire rods	33,173
Plates	13,422

The number of blast furnaces in operation was 136. The coal output was 304,733 tons, or 33,224 more than in 1901. The output of fire clay was 161,312 tons. The production also included 30,095 tons of copper ore, and 48,783 tons of zinc ore. The number of workingmen employed was 30,750. Of this total 10,496 were engaged in the iron mines, 1733 in other metal mines, 2179 in the collieries and 15,255 in the iron works.

Negotiations have been proceeding for some time between the iron ore exporting companies of Sweden—viz., the Grängesberg-Oxelösund Traffic Company on the one hand, and the Lapland Ore Company on the other, with the object of concentrating the Swedish ore export under one management. The quantities of ore proposed to be annually worked and exported are, from Kiruna 1,500,000 tons, to be shipped from the Norwegian port of Narvik, on the Ofoten Fjord; 600,000 tons of Gellivare ore, to be shipped from the port of Lulea on the Gulf of Bothnia, and 600,000 tons Grängesberg ore from Oxelösund, on the Baltic.

The Watertown Engine Company of Watertown, N. Y., have recently opened a Chicago office at 27 North Canal street in charge of the W. P. Lyons Company.

Structural Steel Officially Defined.

The United States General Appraisers, at New York, July 30, 1903, officially defined structural steel, the claim having been made that pieces of flat steel were entitled to entry at the rate of duty imposed on structural steel. The importations were made at San Francisco, and the collector of customs had decided that they were not dutiable as structural steel, but took a higher rate, from which the importers appealed. Following is the decision:

The merchandise in question consists of steel plates valued at 4½ cents per pound. The plates are 1 inch in thickness, and vary in width from 12 to 24 inches and from 14½ to 19 2-3 feet in length. Duty was assessed thereon at the rate of six-tenths of 1 cent per pound under the provisions of paragraph 126 of the act of July 24, 1897. The importers claim that the merchandise is properly dutiable at the rate of five-tenths of 1 cent per pound under the provisions of paragraph 125.

Paragraph 126 provides a duty of six-tenths of 1 cent per pound on "boiler or other plate iron or steel, except crucible plate steel and saw plates, . . . not thinner than No. 10 wire gauge, sheared or unsheared. . . ." Paragraph 125 provides a duty of five-tenths of 1 cent per pound on "beams, girders, joists, angles, channels, car truck channels, T T, columns and posts or parts or sections of columns and posts, deck and bulb beams, and building forms, together with all other structural shapes of iron or steel, whether plain or punched, or fitted for use. . . ."

We are of opinion that the assessment and protests are both untenable. Plate or sheet steel cut up into required lengths, even though intended for use in building construction, are not structural shapes, and are not *ejusdem generis* with the class of article enumerated in paragraph 125. A reading of that paragraph clearly shows that Congress meant to cover and did in fact cover only that class of articles made of iron or steel, made into their desired form or shape for structural use, and which by their forms or shapes are readily recognizable as structural forms or shapes. Surely no person would recognize pieces of flat steel 1 inch in thickness as of that class. In modern building construction sheet steel is frequently riveted to floor beams to make a flooring, yet no one can reasonably claim such sheets are structural forms. On these facts the claim of the importers must be overruled. The assessment of duty was in our opinion erroneous. The merchandise does not consist of "boiler or other plate iron or steel," but forms and shapes of steel, a class of article provided for in paragraph 135. The pertinent provisions of that paragraph read as follows:

135. . . . Pressed, sheared or stamped shapes; . . . sheets and plates and steel in all forms and shapes not specially provided for in this act; . . . valued above 4 cents and not above 7 cents per pound, 1 3-10 cents per pound.

The fact that the imported articles were cut from sheets or plates of steel takes them out of paragraph 126, for they are no longer sheets or plates, but forms or shapes, not structural in form, and answer the description set out in paragraph 135. What is meant by "sheared" in paragraph 126 is that process of finishing which results in trimming off the rough edges of sheets or plates after the process of rolling is completed, and does not include articles cut out of such sheets or plates. Such cutting up results in destroying the form and character of sheets and plates and makes a new class of article with new name, character and use. In fact, these articles answer the specific description of "sheared or stamped plates," mentioned in paragraph 135. The protests are overruled and the decisions of the collector will stand.

Final arrangements have been completed for the establishment of electrical manganese works at Shawinigan Falls, Quebec, by the Electrical Manganese Company, of which B. E. Kingman of New York is the president. The company have secured some 12 acres of land on the line of the Great Northern Railway, at Shawinigan and have contracted with the Shawinigan Water & Power Company for the delivery of 5000 horse-power.

The Iron Age

New York, Thursday, August 13, 1903.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

How British Trade Is Lost.

A recent report made by the British Consul-General at San Francisco has caused some amusement in this country among those who have had opportunity of reading it. When British trade declines there must obviously be some special reason for it, and the business of the consular agent is to solve the mystery and divest what would otherwise be a miracle of its supernatural character. That it should have come about from natural causes is, of course, inconceivable. Consul-General Bennett appears to be a past master at the solving of trade mysteries. His thesis is that San Francisco should be a great and profitable market for all kinds of British manufactures. The inferior productions of the Eastern States should have no place in its commercial economy. Why is it, then, that the people of the Pacific Coast are so ill advised as to their own interests as to be, or at least seem, indifferent to the advantages of British goods? To answer this momentous question is the congenial task of Mr. Bennett, and he essays it with much enthusiasm.

The first reason is that the people of California do not know what they are missing. Mr. Bennett says:

> San Francisco should be visited by direct representatives of British houses. Old established British firms, no doubt, carry on large businesses through their branches at home, but the British commercial traveler is almost unknown. I have made careful inquiries as to British commercial travelers coming direct from the United Kingdom to the Western States, and can, so far, find no record of any.

An English "bagman" who should follow the suggestion of Mr. Bennett and come to San Francisco with his assortment of samples would have an interesting experience. His proneness to take the people of that city quite seriously would lead him into all sorts of embarrassments. Mr. Bennett learns that it is at present the custom of houses with headquarters in New York who have dealings with British manufacturers to send travelers all over the United States to solicit trade, and it pains him greatly that some of these concerns are German. Patriotic considerations are, of course, paramount to those of business. They will sell English goods if they must, but they prefer to help the Fatherland along a bit by selling German goods to any one who will have them, and a great many appear willing to be thus imposed upon. Perhaps as good an explanation of this curious propensity as can be had is furnished by Mr. Bennett in the following pregnant sentences:

> As a rule German New York houses are intrusted to sell British goods, but they as a rule try to sell a German made article and if unsuccessful, then, and only then, offer the British made goods. The reason is that German goods are cheaper, look as well and pay them larger commission. A large German house, with a branch in New York, with their own cutlery factories in Germany and one in the United States, is given the exclusive agency for the best known brands of British pocket cutlery. When their travelers go to sell they offer the German made goods first, the American second, and if they can sell either they do not mention or show the British. Is it surprising that the United Kingdom is so fast losing her American cutlery trade?

If this condition of affairs actually exists and the reasons for it are those which Mr. Bennett has discovered, a diplomatic note from Mr. Balfour to Secretary Hay, intimating that such behavior on the part of the German houses located in New York is "inconvenient," and if persisted in might disturb the amicable relations between Great Britain and the United States, would be in order. Great Britain is not being treated on the most favored nation basis, and considering the extreme liberality, not to say reckless generosity, with which she has lately dealt with one of our New Jersey corporations, the International Mercantile Marine, the German importers and jobbers should be made to understand that their discrimination is liable to create an intolerable condition. The British lion will stand a good deal of abuse in one way or another, including any amount of Congressional tail twisting, and say nothing about it; but when the commercial rights of British subjects are trifled with in this fashion he makes his growl follow the reveille around the world.

In the matter of the diminishing trade of England with California, however, it appears that the British manufacturer is not quite free from blame by reason of lack of enterprise. Mr. Bennett says:

> There appears to be a lack of initiative on the part of traders at home, and too great a reliance on the efforts of New York houses to press British trade. I have been told of cases where certain British goods were sure of a market, in fact there was one already created, but in consequence of the goods having been consigned to a San Francisco house, which, with the object of controlling the whole trade, had in every case carefully destroyed all traces of the name of the manufacturer on the goods, and then for some reason ceased to import any more, the supply ran out. Customers urgently demanded them, and finally, after great trouble, the manufacturing house was found and the goods were again supplied. Here is a case where a traveler in that line would have found a ready market, and if it has not been lost the fact is not owing to British energy but the insistence of customers on having that article and no other.

As anything like a suspicion of humor in a British consular report is unimaginable, the conclusion is obvious that Mr. Bennett has got his information from some one who has greatly enjoyed being freely and imaginatively communicative. The existence of a howling void which only unattainable British cutlery could fill would be a curious phenomenon in trade. It is well known how easily all trace of the source of such goods may be obliterated. If scraping boxes will not do it grinding out makers' brands probably would, and that this was done may be inferred from the fact that those who wanted to duplicate these English goods found so much difficulty in doing so. Obviously the San Francisco Board of Trade should add to its staff a Sherlock Holmes to aid its members in tracing the origin of things they want and cannot buy. There would appear to be a deep laid and ingenious plot to deprive the British manufacturer of the trade which belongs to him. It should be frustrated and brought to naught.

The gem of Mr. Bennett's report is found in the paragraph in which he becomes circumstantial and employs specific facts to "give verisimilitude to an otherwise bald and unconvincing narrative." That his purpose does not appear to have been fully accomplished is in no sense his fault, and the only comment it suggests is: So much the worse for the facts. Of the extraordinary performances of the two British traveling salesmen Mr. Bennett says:

> Since writing the above I have obtained news of two more British commercial travelers, and, curiously enough, the reports of both of them are practically identical, though they were traveling for different trades. One was anxious to extend the hardware trade in California, and telegraphed to a large house here that he would be pleased to show his goods to the San Francisco house if the merchant would meet him in St. Louis (a trip of 2000 miles). The merchant declined this offer, and the traveler came on to San Francisco, arriving in the morning and going back again on the evening of the same day. In the second case the traveler invited the merchant to come to New York (3500 miles) to see the goods, and on his declining the deal was declared off. There is hardly such a demand for British goods that an American merchant would be likely to travel 4000 miles in the one case and 7000 miles in the other, losing at least 12 or 15 days, respectively.

for the purpose. The latter case was told me by a British merchant, and both can be relied upon as perfectly correct in fact.

To those who may be disposed to question the value of commercial literature of this kind, it is probably sufficient to remind them of the extent to which it is capable of contributing to the gayety of nations. In many respects Mr. Bennett's explanation of the fact that British trade with the Pacific Coast is not a great deal larger than he finds it is one of the most entertaining documents we have had the pleasure of reading in a long time. It savors of the subtle humor of Gilbert, and that he is in deadly earnest makes it all the funnier.

We fear Mr. Bennett has unintelligently caricatured the English traveling salesman as much as he has misrepresented American business conditions. If not, the best suggestion we can offer those wishing to extend the field for British manufacturers in this country is to employ representatives with some idea of American business methods and market requirements. They will not learn very much of value from such consular literature as that from which we have had the pleasure of quoting.

Iron and Steel Stocks.

Peculiar views appear to be entertained with regard to the decline in the value of the stocks of the United States Steel Corporation and other iron and steel companies whose securities are dealt in on the New York Stock Exchange. Prices of these stocks have fallen very much below what people generally think should be a fair value for such securities. They are alarmed over this condition, and are of the opinion that something must be radically wrong. They are, in fact, almost panic stricken to think that iron and steel stocks should reach such exceedingly low values. Without entering into the discussion of the general causes which underlie the great decline in the stock market, which has driven standard railroad stocks, always in high favor among investors, to very low prices, it may be well to consider the course of the iron and steel stocks independently. When these stocks first began to be dealt in on the Stock Exchange the fact was pointed out that they would be particularly sensitive to trade conditions, even to those which might only temporarily affect production and consequently diminish earnings slightly. They differ quite considerably from railroad stocks in point of regularity of income and steadiness of operation. We have since then seen how labor troubles have in a number of instances adversely affected these industrial stocks. Up to this time, however, we have not had a diminution of business or anything beyond a slight decline in prices to contend with. The downward tendency in pig iron and some other products, which has been a feature of the summer months, is therefore a new experience in stock market conditions as regards these industrials. Holders of such stocks of course cannot avoid feeling some apprehension as to the possibility of earnings diminishing so seriously that dividends may be suspended or reduced. This, however, is a contingency which holders of such stocks must face. They could not expect in the nature of things that trade would always keep up to the great volume of the past few years. It must be recognized that the conditions have been extraordinary. But now that some shrinkage has occurred in the demand for iron and steel and prices have started on the down grade, the holders of these securities should not permit themselves to be frightened into the belief that their stocks will continue to fall in price until they are of no value. It is possible that earnings may continue sufficient to steadily maintain dividends on preferred stocks through a period of some depression, but even if earnings were to be so greatly curtailed that full dividends could not be paid on preferred stocks, both these and common stocks would still have a speculative value, just as railroad stocks have had under similar conditions. Holders would then have to wait until the demand revived sufficiently to bring earnings back to a normal dividend paying point. The decline is simply one of the contingencies which was to be expected when manufacturing enterprises were brought into connection with operations on the Stock Exchange. No stocks can always move upward, nor can they be maintained at a fixed price.

CORRESPONDENCE.

"Build" or "Manufacture."

To the Editor: Which is better usage, to "build" a machine tool or to "manufacture" it?

NEW ENGLAND.

NOTE BY THE EDITOR.—We are of the opinion that it is customary in the trade to designate heavy machine tools as "built," and to refer to those which are so light that their parts can be assembled by hand as "manufactured." It occasionally happens that a maker of some small bit of machinery will use the word "build" in referring to his work, but this is regarded as an affectation. We will be pleased to hear from our readers on this subject.

PERSONAL.

W. M. Carpenter, formerly assistant to the general manager of the Buhl Malleable Iron Company, Detroit, Mich., has been appointed general manager of the Norway Iron & Steel Company, York, Pa.

William W. Hearne of Mathew Addy & Co. has resigned from the Board of Directors of the Salisbury Steel & Iron Company of Little Falls, N. Y.

B. E. Schonthal, secretary and treasurer of the Schonthal Iron & Steel Company of Cumberland, Md., has left for a trip along the Pacific Coast in behalf of his company. He expects to visit all points of importance between Seattle and San Francisco.

Among those who are candidates for membership to the Iron and Steel Institute are Edwin N. Martin of Pittsburgh; Ernest Derwent of Ironton, Ohio; Dr. Bradley Stoughton of Columbia College and G. S. Whyte of Chicago.

Official announcement was made on August 6 that John L. Jerome had resigned his office as third vice-president and treasurer of the Colorado Fuel & Iron Company. Albert A. Miller has been appointed assistant treasurer of the company, with offices at Denver. Mr. Miller will have full charge of financial matters.

Lieut. Godfrey L. Carden, superintendent of arsenal tools, department of machinery of the St. Louis Exposition, has returned from abroad, where he met with great success in securing exhibits of notable steam and gas engines, boilers, etc., by the most prominent builders in various European countries.

H. F. J. Porter, who some time since severed his long connection with the Bethlehem Steel Company, has been placed in charge of the publishing department of the Westinghouse interests with headquarters at Pittsburgh.

At the forthcoming meeting of the Colorado Fuel & Iron Company of Pueblo, Col., Frank J. Hearne will be elected president, to succeed J. A. Kebler, who has resigned. Mr. Hearne was for many years at the head of the Riverside Works, at Wheeling, W. Va., and was president of the National Tube Company.

The color line has been drawn by a union labor organization at Newport News, Va. The Machinists' Union of Newport News, the local branch of the International Association of Machinists, has voted to sever its affiliation with the Central Trades and Labor Council. The latter recently admitted representatives of negro labor unions to its membership, despite the protests of the Machinists' Union.

Notes from Great Britain.

Dumping a Surplus.

LONDON, August 1, 1903.—In the discussion on preferential tariffs, now raging in this country, an important factor will be that which is commonly called "dumping." British manufacturers, having always made not to maximum but to average demand, have seldom got anything to "dump." They therefore feel acutely that when the surplus products of American or German competitors are thrown upon the British market, at cutthroat prices, they are being badly treated. Prominent iron and steel manufacturers are wonderfully unanimous in their detestation of this particular policy. Apart from its more or less spurious importance (for, after all, even in the worst times, the amount of iron and steel dumped is relatively small), it is an important part of the agitation, because it strikes the popular imagination. Trade of this sort is freely denounced as "illegitimate." For example, a leading journal in this country only last week editorially observed:

One of the important questions that must have a material bearing on the views taken of the existing fiscal situation in this country, from the iron trade point of view, is that of how far Germany and the United States are engaged in legitimate competition with England, in contradistinction to the prevailing system of shipping iron and steel to this country, regardless of its cost at the place of production, and without respect to its fulfillment of the first essential of legitimate competition, which we take to be that of manufacture and sale with a fair profit. No one can doubt that in the past there has been a great deal of competition that was not fair to British manufacturers, and that not in foreign markets only, but in our own home markets as well. Otherwise the German iron and steel producers could never have raised their exports to this country, as they have done, from less than 200,000 tons to more than 800,000 tons, within three or four years. This unfair competition is reflected, *malgré lui*, in the reduced dividends paid by German manufacturers during that period, and in the differences that distinguish prices quoted at home from those quoted abroad. During the greater part of last year, while Germans were quoting bars at about £5 per ton delivered in this country, the same products of English manufacture were being quoted at nearly 20 shillings above that figure, and similar differences were noted in billets, blooms and some other descriptions. What has been the result? In Germany few of the great steel manufacturing concerns have paid dividends in 1902, whereas here non-dividend paying concerns have been quite the exception. This result is in consonance with what we know of the conditions of manufacture. In this country basic iron is quoted at about 8 shillings 6 pence per ton under the quoted prices of the same descriptino in Germany. The Cleveland price is 49 shillings; the Dortmund price is 57 shillings 6 pence. Unfortunately, however, we only make about 800,000 tons annually of basic steel, while the Germans make more than 5,500,000 tons of that variety. We must, therefore, compare German basic with British acid steel, in order to get at the real facts as supplied to maximum production. In this way the comparison is much less favorable to England, for hematite iron, whence fully four-fifths of our total output of steel is made, costs within a shilling a ton of the price at which German basic steel is quoted, thus making the costs of production, so far as the pig iron is concerned, nearly the same. The German costs of making steel billets to-day are approximately as under:

Approximate costs per ton of steel billets at Westphalian works:

	£	s.	d.
23 cwt. of pig iron	3	6	0
Labor		4	9
Ferromanganese		1	9
Coal, coke and limestone		3	6
Refractory materials and supplies		2	9
Repairs of molds, &c		5	0
Clerical and laboratory expenses		0	10
Total	£4	4	7

This estimate does not, of course, take account of depreciation and renewals, interest on investment, taxes and rates, and other charges, which will bring the total cost to probably not less than £4 15s. per ton.

So far as we are aware, there is no reason why British works, when well organized and favorably situated, should not be able to produce at quite as low a figure as this, and possibly something less. Basic steel billets should in this country, for the reasons already stated, be produced at a materially lower figure. In neither case, however, is the British cost of much avail to British manufacturers. They know neither the day nor the hour when their markets will be invaded and their values wrecked, by the needy and the unconscionable of other countries. If the figures we have given be accurate—as we fully believe them to be—there is no reason why German steel should ever find its way into this country on its merits. The German works have generally a considerable railway transport to provide for, as well as transport across the Channel, two breakages of bulk, and an inland British freight, all of which are uncalled for in the case of British manufacturers supplying their own local markets. But when the Germans find that they cannot sell all their stuff at home, they must, under existing conditions—being largely in the hands of financial houses and bound by them to provide for a certain turnover—sell abroad for what they can get. For the last two years there has usually been a difference of 7 to 12 shillings per ton between the prices quoted to home consumers in Germany and those quoted to foreign consumers in Great Britain and elsewhere.

The effect of this condition of affairs has been that the last three years this country has paid more than £20,000,000 sterling to Germany for iron that could and would have been produced at home under what we have described as legitimate competition. Large as this sum is, it is probably considerably less than the sum that has been lost to British manufacturers by the depressing influence of the constant presence of such serious dead weights as the German necessity to sell at any price.

This quotation, if somewhat lengthy, at least betrays the inner mind of the British iron and steel manufacturer.

There is, however, another side to the story. The self same iron and steel manufacturers have been getting high prices from the makers of finished products, much to the latters' detriment. The manufacturer of finished products has, during the past few years, been squeezed, upon the one hand, by the high prices of raw material and semi-finished metals, and upon the other hand by German competition. He is therefore only too glad to be able to fall back upon American or German iron and steel, not so much in the matter of quantity as in obtaining his raw material at a marketable price. The absence of foreign competition inevitably means anxiety for the engineer and hardware manufacturer. Prices of articles that go into catalogues cannot be manipulated with the same ease and rapidity as are the prices of raw iron and steel.

Notes on Shipping.

The results declared by the principal German steamship companies for the past year have already been given, but what is almost the complete return is very striking:

	1902. Dividend. Per cent.	1901. Dividend. Per cent.
Hamburg-American Line	4.5	6
North German Lloyd	..	6
German Hansa Company	5	8
Kosmos Company	9	12
Hamburg South American	..	4
German East African	2.5	2
German Australian Line	5	8
German Levant Line	2	6.5
Bremen Argo Company	..	3
Bremen Neptune Company	5	7
Flensburg S. S. Company	..	6

It will be seen that, with the single exception of the German East African line, there is a substantially decreased return in each case. And as to the German East African, there is no doubt that only the possession of a heavy subsidy enabled it to pay a dividend at all.

New Screw Propellers.

The Admiralty are very much excited over the results of the recent trials with new forms of screw propellers. The ideal now is a blade shaped like a Japanese fan. It is an amazing fact that very little is known about the untried possibilities of screw propellers until quite recently, and yet one need not elaborate the importance of the matter to both the Royal Navy and the mercantile marine. It is calculated that at an average cost of £4000 per vessel the speed of nearly all our battle ships and cruisers can be increased about a knot, wth a reduction in the coal expenditure, if we fit them with new screw propellers. Another important point is the reduction of vibration, which at high speed prevents the accurate laying of guns.

The New Scouts.

The official communication as to the four firms to construct the new scouts has now been issued by the British Admiralty. The firms are the Fairfield Company, who are building now the "Forward"; Vickers Sons & Maxim, Limited, who have the "Sentinel" in hand; Sir W. G. Armstrong, Whitworth & Co., Limited, who have the "Adventure" on the stocks at Elswick, and Laird Bros., who got the original contract for the "Pathfinder." The new vessels will be duplicates of those in hand. They vary from the 2900 tons displacement and 17,000 indicated horse-power of the "Sentinel," to the 2545 tons and

16,000 indicated horse-power of the Fairfield boat. In each case the builders guarantee 25 knots speed with 150 tons of coal in the bunkers. The armament in each case is to be the same—ten 12-pounder quick firers. I may also add now that it is the intention to order the new torpedo boat destroyers from firms who are now completing the 25½-knot destroyers ordered a year ago, as soon as they pass one of their vessels successfully through trials. Prices for the new work will be arranged on the old basis, not necessarily at the same scale of wages, &c., the price of the four or five firms interested being sufficient competition.

Important Gun Trials

In the gun trials conducted by the Chilian Naval Commission, Vickers Sons & Maxim (Limited) have established a record in power for their 7½-inch naval or coast defense guns. One of these guns made for the new Chilian battle ship "Libertad" at the company's Sheffield works developed with its 200-pound projectile, a muzzle velocity of 3003 feet per second under normal conditions of pressure, showing a muzzle energy of over 12,500 feet tons. In other words, these guns, using capped shot of the Vickers pattern, can perforate the latest type of 6-inch armor at a range of between 3 and 4 miles.

These results, it is contended, prove the advantage of nitro-cellulose as a propellant for the modern wire-bound gun. The Chilians, like most of the European and American powers, adopt this compound, and the 7.5 inch weapon tried developed the exceptionally high velocity of 3003 feet per second with a pressure of 18½ tons to the square inch. The British "service" weapon of this caliber, using cordite, is in official records given a velocity of only 2600 feet per second. The effect on energy is most marked. The guns for the Chilian ship developed a muzzle energy of 12,570 foot tons, as compared with 9340 foot tons in the case of the "service" weapons. The effect against modern armor is in direct proportion. At a range of 2000 yards the Chilian gun, using capped shot, would perforate armor of the most modern type 7 to 8 inches thick, and at fully 3 miles' range 5 to 6 inch armor.

Improved Coal Shipping Appliances.

The London and Northwestern Railway Company are about to erect at Garston a tip capable of lifting 30 tons to meet the demand from the Lancashire collieries for facilities for shipment of wagons carrying 15 tons of coal. The introduction of this class of wagon appears to be largely increasing in the Lancashire district, and as a truck capable of carrying this weight costs very little more than an 8 or 10 ton truck, it enables economies to be effected in siding room and shunting at the pits.

Chinese Machinery Contracts.

The Chinese Government is placing considerable contracts for machinery and materials connected with the peaceful development of the Empire, and the European factories are securing contracts from various private quarters in the same direction. Efforts are being made to bring some of the older Government institutions into line with current needs. The rehabilitation of the defensive services is not the chief concern of the Celestial administration. Things move slowly at Pekin, but they may be thought to move, on the whole, in the right direction; and there is reason to anticipate a gradual Occidentation of the methods of government, which, indeed, would proceed more rapidly if it were not for the obstacles set up by international jealousies on the spot.

The Markets.

The market is deadly dull for many reasons, notably that Bank Holiday corner on Monday. Apart from that the consumers are steadily pursuing their policy of buying from hand-to-mouth. They are gradually bearing down prices, notwithstanding the stubborn attitude of iron and steel makers. This is borne out by the ascertainment of the Midland Wage Board, which shows an all round reduction of 2s. 5d. per ton on the previous two-monthly period.

Notwithstanding the bearing down of prices as is here indicated, standard quotations are the same. The moment is rapidly approaching when official notice must be taken of this persistent sagging of prices. S. G. H.

OBITUARY.

WILLIAM E. DODGE.

William E. Dodge, the senior member of Phelps, Dodge & Co. of New York, died on August 9 at Bar Harbor, Maine, of heart disease. He was the son of William Earl Dodge, who entered the firm of Phelps & Peck, metal dealers, in 1833, the firm name becoming Phelps, Dodge & Co. He was born in 1832 in New York, and in 1864 became a partner in the firm. Both father and son were active support of the Union during the Civil War, and at its close the Legislature of the State passed a resolution of thanks for his services as a member of the Commission for the State of New York to supervise the condition of the troops in the field. He was a member of the first Executive Committee of the Union League Club, and although the men whose desire to support the Union in its time of peril led to the founding of the club were all his elders by many years, the early records of the organization show his name as one connected with many of its activities. In addition, he was an officer of the Loyal Publication Society, and an Advisory Director of the Woman's Central Association of Relief, as the result of which the Sanitary Commission was instituted. He became identified with the Metropolitan Museum of Art, the American Museum of Natural History and the Botanical Garden, serving as chairman of the Executive Committee of the first mentioned and vice-president of the second, and was connected with the New York Academy of Sciences, the Linnæan Society of New York, and the American Historical Association. The business life of William E. Dodge was very varied in its interests, and the connection with Phelps, Dodge & Co. constituted only a single branch. The town of Ansonia, Conn., had been named after his grandfather, Anson G. Phelps, and its industries were closely watched by members of the two families. William E. Dodge became president of the Ansonia Clock Company and a director of the American Brass Company. He was also a trustee of the Atlantic Mutual Insurance Company, a director of the Detroit Copper Mining Company of Arizona, of the Commercial Mining Company, the Copper Queen Consolidated Mining Company, the El Paso and South Western Railroad, the Lackawanna Steel Company, the Morenci Southern Railway Company, the Nacozari Railroad, the Morningside Realty Company, and of the United Globe Mines, and a trustee of the New York Life Insurance Company. Mr. Dodge was vice-president of the New York Chamber of Commerce at the time of his death.

ROBERT ATHERTON of the Atherton Machine Company, Paterson, N. J., who since 1848 had been identified with the manufacture of textile machinery, died on August 5 of heart disease. Mr. Atherton was born in Westchester County, N. Y., and after leaving school went to Paterson, where he learned the trade of machinist under the direction of William Beresford, who conducted a large plant for the manufacture of rollers for cotton machinery. Later he was employed by Benjamin Buckley, and in 1863 he embarked in business for himself.

The United States General Appraisers, New York, have decided that articles made out of castings, which have been turned, drilled, ground and polished, and which have been fitted together and fastened with screws and clamps, are not dutiable as castings, but are dutiable under paragraph 193, act of July 24, 1897, as manufactures of metal. The articles provided for in paragraphs 135 and 148, as castings, are only such articles which are imported in the form and substantially in the condition as they come from the mold. The decision was rendered in the case of importations by the St. Louis Car Company of castings requiring but little fitting to make them perfect and complete air brakes.

The Columbia Iron Works, St. Clair, Mich., have assigned and the plant has been placed in charge of J. C. Gilchrist of Cleveland, for whom the steel boats are under construction at the yards. The company have a capital stock of $100,000.

Lake Ore Notes.

DULUTH, Minn., August 9, 1903.—The commerce of Lake Superior has evidently passed this year into the 5,000,000 ton a month class. Last year it was between four and five million tons each of the heavier months. July, 1903, has broken all preceding records, with a total net tonnage of freight passed of 5,279,428. The freight interesting to mining men has been as follows, with some comparisons, all in net tons:

	Iron ore.	Copper.	Pig iron.	Total freights.
Month of July, 1903...	3,752,428	11,381	3,019	5,279,428
Season to August, 1903.	11,291,900	43,945	4,149	17,224,362
July, 1902.....	3,787,666	18,748	....	5,082,398
To August, 1902.....	11,589,032	54,362	7,396	16,588,899
July, 1901.....	3,351,294	13,861	5,806	4,781,072
To August, 1901.....	7,694,512	38,508	16,759	11,548.192
July, 1900.....	2,783,555	17,470	6,071	4,101,765
To August, 1900.....	8,459,513	59,801	10,163	12,752,246
July, 1899.....	2,557,060	19,208	4,370	4,024,789
To August, 1899.....	6,474,720	45,343	13,319	10,433,807

These comparisons present some rather unexpected figures, especially in pig iron and copper.

The above diminution in iron ore is entirely from old ranges, Michigan and Wisconsin, and is further accentuated by additional decreases from Escanaba, making a total falling off from last year to date of 648,000 tons, while the increase from Minnesota to this time has been 373,143 gross tons, so that the old range decrease has been actually 1,021,000 gross tons so far this season. That this is not due to bad underground outlook at old range mines is shown by the fact that at many places they are clearing additional stock pile ground on surface and are preparing to accumulate a part of their summer hoist above ground, something that has not been done for a long time.

To August 1 shipments from the various upper lake ports have been as follows, with comparisons:

Ports.	1902.	1903.
Two Harbors.....	2,782,298	2,852,659
Duluth	2,634,231	2,745,845
Escanaba	2,546,861	2,144,588
Superior	1,858,487	2,081,981
Ashland	1,786,254	1,434,064
Marquette	1,318,206	1,040,564
Gladstone	46,882	25,942

At the annual meeting of the Lake Superior Mining Institute, to be held on the Marquette range, August 16 and later, the following papers will be read: "Sinking and Equipping No. 9 Shaft, Ashland Mine," by H. F. Ellard, superintendent of the mine; "A Card System for Mine Supply Accounts," by F. W. Denton, manager for the Stanton copper mines; "Titaniferous Iron Ores," by N. P. Hulst, vice-president Oliver and Minnesota Iron companies; "Iron Ore Deposits of Arctic Lapland," by Chase S. Osborne, who has just visited them; "High Explosives: Their Methods of Handling," by J. H. Karkeet, Iron Mountain; "A New Changing House at Cliffs Shaft," by J. S. Mennie; "Materials Other Than Wood for Shaft Linings," by Prof. F. W. Sperr of the Michigan College of Mines; "Champion Mine Intake Tunnel," by F. W. O'Neill, superintendent; "Mine Accounting," by W. M. Jeffrey, auditor Oliver and Minnesota Iron Companies. There may be other papers not yet announced. During the meeting there will be excursions to Munising and Sault Ste. Marie.

New range independent ore producers, with the exception of Corrigan, McKinney & Co., are much ahead of last year. The various Sellwood mines have shipped three times as much ore as to August, 1902; Pickands, Mather & Co. have decreased at one or two properties, but have more than made it up elsewhere; M. A. Hanna & Co. are ahead; Tod, Stambaugh & Co. are ahead of any preceding year; so with the Mohoning and other independents. In some of these instances the improvement is due to new mines, in others, notably Tod-Stambaugh, to heavier shipments from old ones. Corrigan, McKinney & Co., while they have materially curtailed at some mines, have Commodore and Jordan, which at this time a year ago were not shippers, and may not be very far behind.

Three shafts are to be sunk at the new Monroe mine of the Mesaba range, situated in the east half of the southeast quarter of Section 28, 58, 20. Two of these will handle the product from a large milling pit, and the third will open an extensive underground territory. Figures from stripping contractors for the large milling pit are expected shortly, and work will probably be carried on during the coming winter, so that the mine may be a producer another season. It is one of the very large ore deposits of the Mesaba, with all the term implies, and is of a high grade, both chemically and physically. The mine is a very important acquisition to the United States Steel Corporation.

Two important finds are reported on the Mesaba. One is in the southeast quarter of the northwest quarter of Section 25, 58, 17, close to the Howe mine of the Republic Iron & Steel Company, where more than 2,000,000 tons of merchantable ore have been shown this summer. The other is in Section 15, 59, 14, east of the D. & I. R. road, where Adams & McInnis have a number of pits and one drill hole in excellent ore. The drill hole is nearly 50 feet in ore, the pits from 10 to 20 feet, but with indications of continuance. This property Mr. Adams says he and associates will operate themselves. It is becoming more and more apparent to ore discoverers that there is a better thing for them in operating the better grade mines than in selling at the prices that have been obtainable for these grades.

Two diamond drills working in the Atikokan region, on the Canadian side of the boundary, have opened into what seems to be a valuable deposit of sulphur. This is about 150 miles from Lake Superior, at Port Arthur, and on a railroad.

Water in considerable quantity has been cut in the Gibson mine, Menominee range, and the property will be abandoned. Work has been carried on there continuously for four years with sufficient encouragement to warrant continuance, but without much ore at any time. The two shafts have reached a depth of 300 feet. At Great Western, Crystal Falls, where all available stock pile room was occupied, a shovel has been put in the pile and shipments will be more rapid. This mine is now a well equipped property, able to mine ore rapidly and at low cost.

Exploring crews have been put at work in the Waukon, Allamakee County, district of Iowa, where ore has long been known to exist. This work is presumably for the United States Steel Corporation. Assays of ore from Iron Hill deposit there have been as follows: Iron, 58.54, 54.79, 56.76, 54.32, 66.92, 58.68, 47.88; silica, respectively for first three, 4, 5.12, 11.02; phosphorus, 0.13, 0.30, 0.13, 0.503, 0.115, 0.18. An effort is now being made on the part of local people, aside from these explorations, to secure the development of these properties. The ore is a surface deposit, covered with a very light surface, is porous in structure and low in sulphur. Small shipments to Milwaukee have been under way some time. Iron ore not only exists in Allamakee County, but in Dubuque and Delaware counties, all of which lie along the eastern boundary of the State. D. E. W.

The American Furnace & Machine Company, engineers and contractors of Pittsburgh, Pa., builders of furnaces of all descriptions, water seal gas producers and tin plate and sheet mill machinery, have a very large number of contracts on hand at present. This concern are erecting machinery in West Virginia, Indiana, Canada and several places in Pennsylvania. One contract on which they are now working comprises over 20 furnaces and necessary gas producers for same. The company are having a number of inquiries for their J. D. Swindell patent bell coal hopper, and are also receiving large contracts for their patent water seal gas and air valves, and are installing 24 at one plant. They are also installing a large number of special grates in sheet and pair annealing, heating and enameling furnaces. This grate was originally invented for a boiler setting, but it has been adapted to furnaces with satisfactory results. At the present time this grate is being installed under two boilers.

The Buhl Library, presented to Sharon, Pa., by Frank H. Buhl, former president of the Sharon Steel Company, is now nearly completed, and it will be opened soon.

Iron and Industrial Stocks.

Conditions bordering on demoralization prevailed in the stock market for several days during the past week. Two brokerage firms announced their suspension on Wednesday afternoon of last week and this caused the fear that other disasters of the same kind were pending. Consequently continued liquidation took place in both the standard railroad stocks and the industrials. With no further unfavorable developments, the market gradually improved and quite a buoyant feeling set in during the opening days of this week, which did much toward recovering the ground which had been lost. The following quotations show the lowest prices touched on the stocks named during the week, with the prices at noon on Wednesday of this week: American Can, common, 3⅝ to 4⅞; American Locomotive, common, 15⅝ to 17⅝; Colorado Fuel, 40⅛ to 43; Pressed Steel Car, common, 33 to 38; Railway Steel Spring, common, 21½ to 23; Republic, common, 9⅞ to 11⅝, preferred, 59 to 63⅜; Sloss-Sheffield, common, 29 to 33; Tennessee Coal & Iron, 32⅜ to 37½; United States Steel, common, 20⅝ to 21⅞, preferred, 67 to 69½; new 5 per cent. bonds, 76¼ to 77⅝.

The Consolidated Lake Superior Company have extended the time for subscription to the $12,500,000 bonds to August 25.

Dividends.—Niles-Bement-Pond Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15, and a semiannual dividend of 4 per cent. on the common stock, payable one-half September 19 and one-half December 19. For dividend payable September 19 the transfer books will close September 12 and will reopen September 21. For the dividend payable December 19 the transfer books will close December 12 and will reopen December 21.

Pratt & Whitney Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

American Radiator Company of Chicago have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 15.

Blakeslee Forging Company, Plantsville, Conn., have declared a dividend of 1½ per cent.

The Adrian Furnace Blown In.—The Adrian Furnace of the Rochester & Pittsburgh Coal & Iron Company was lighted at noon on the 10th inst. The affair was attended by A. G. Yates, president of the Buffalo, Rochester & Pittsburgh Railway; Lucius W. Robinson, president and general manager of the Rochester & Pittsburgh Coal & Iron Company; Senator Patton of Curwensville, Pa.; Julian Kennedy, Pittsburgh, Pa.; James P. Welsh, general manager of the Fitzpatrick Glass Mfg. Company, Falls Creek, Pa.; A. R. Van Tassel, president of the Union Banking & Trust Company, Du Bois, Pa.; B. M. Marlin, secretary of the Union Banking & Trust Company, Du Bois, Pa.; Hon. W. C. Arnold, Du Bois, Pa.; Eugene Merris of the Merris Beef Company, Du Bois, Pa.; John E. Du Bois, Du Bois, Pa.; Dr. S. M. Free, Du Bois, Pa.; Fred. Lincoln, general manager of the Buffalo & Susquehanna interests, Du Bois, Pa.; Maj. Montrose Barnard, assistant general manager of the Rochester & Pittsburgh Coal & Iron Company, Punxsutawney, Pa.; John Reed, assistant general manager of the Jefferson & Clearfield Coal & Iron Company, Du Bois, Pa., and other prominent citizens of Du Bois. The furnace was lighted by Mrs. A. G. Yates; is situated at Du Bois, Pa., and was designed by Julian Kennedy, engineer, Pittsburgh, Pa. It is 12 feet at the hearth, 19 feet 6 inches at the bosh, 13 feet at the throat and 80 feet high; is equipped with four hot blast stoves, 22 x 80 feet, of Julian Kennedy's design; three high pressure blowing engines built by the Morgan Engineering Company, Alliance, Ohio, and 2500 horse-power of horizontal water tube boilers built by the Aultman & Taylor Machinery Company, Mansfield, Ohio. Thos. W. Kennedy, until recently superintendent of the Isabella furnaces, Etna, Pa., is the superintendent in charge.

E. P. Roberts & Co. of Cleveland, Ohio, consulting engineers, have opened a department of cement engineering, and are now prepared to take charge of the designing and supervision of the construction and operation of cement plants. The cement department opens up a new field, and the services of George S. Perkins have been secured to look after the work. Mr. Perkins is a graduate of Stevens Institute of Technology, class of 1891, in the course of mechanical engineering, and has had an extensive experience in the designing and constructing of cement plants.

CONTENTS.

	PAGE.
The Hilles & Jones Heavy Plate Planer. Illustrated	1
The Premier Steel Works Dismantled	1
The Light Aluminum Alloys	2
The Providence Steel Casting Company	5
The Lindemann & Hoverson New Factory. Illustrated	6
Official Testing of Steel Tapes	9
Unions in Butte	9
Northern Motors Operating a Milwaukee Turret Lathe. Illus.	10
Fuel Oil	10
Machine for Grinding Twist Drills for Wood Boring. Illus.	11
The Dover Forge & Iron Company	11
A Great Captain of Industry, John Ericsson	12
The Nelson Loose Pulley. Illustrated	13
Holthoff Machinery Company Purchased	13
The Molding Machine. Illustrated	14
The Tallerday Sheet Steel Pipe Connection. Illustrated	18
Production of Tungsten, Molybdenum, Uranium and Vanadium in 1902	19
The Iron and Steel Institute	19
The Philadelphia Molders' Settlement	19
Temperature Reactions in the Blast Furnace. Illustrated	20
Norcross Brothers	21
The Forter-Miller Engineering Company	21
The Lincoln-Williams Twist Drill Company	21
The Republic Iron & Steel Company	22
Structural Steel Officially Defined	23
Editorial:	
How British Trade Is Lost	24
Iron and Steel Stocks	25
Correspondence	25
Personal	25
Notes from Great Britain	26
Obituary	27
Lake Ore Notes	28
Iron and Industrial Stocks	29
The Adrian Furnace Blown In	29
Manufacturing:	
Iron and Steel	30
General Machinery	30
Power Plant Equipment	30
Foundries	31
Bridges and Buildings	31
Fires	31
Hardware	31
Miscellaneous	31
Canadian Bounties in Parliament	32
The Iron and Metal Trades:	
Comparison of Prices	33
Chicago	33
Philadelphia	35
Cleveland	36
Cincinnati	36
St. Louis	36
Pittsburgh	37
Birmingham	38
New York Machinery Market	39
New York	40
Pig Iron Sharply Reduced	40
Metal Market	41
The Boston & Albany Machinists	41
Trade Publications	42
Hardware:	
Condition of Trade	43
Notes on Prices	44
Morley Bros.	45
Trade Items	45
Michigan Retail Hardware Dealers' Association. Portraits	46
British Letter	53
Advertising Advertised. Illustrated	53
Price-Lists, Circulars, &c.	54
Movable Platform for Window Floor. Illustrated	54
A Little Experiment in Exporting, But a Very Unsatisfactory One	55
The Salesman and Western Trade	56
Fine Cutlery Sets Leather Cased	56
The Oliver News	56
Remington Arms Company's New Catalogue	57
Thin Decorated Pen Knives. Illustrated	57
Little Giant Stock and Screw Plates. Illustrated	57
Twelve-Tine Safe Edge Fork. Illustrated	57
Combination Clamp and Bench Vise. Illustrated	58
Dixon's Eterno Pencil. Illustrated	58
Heavy Hack Saw Frames. Illustrated	58
Current Hardware Prices	59
Current Metal Prices	66

Lake Ore Notes.

DULUTH, Minn., August 9, 1903.—The commerce of Lake Superior has evidently passed this year into the 5,000,000 ton a month class. Last year it was between four and five million tons each of the heavier months. July, 1903, has broken all preceding records, with a total net tonnage of freight passed of 5,279,428. The freight interesting to mining men has been as follows, with some comparisons, all in net tons:

	Iron ore.	Copper.	Pig iron.	Total freights.
Month of July, 1903...	3,752,428	11,381	3,019	5,279,428
Season to August, 1903.	11,291,900	43,945	4,149	17,224,362
July, 1902.....	3,787,666	18,748	....	5,082,398
To August, 1902.....	11,589,032	54,362	7,396	16,588,899
July, 1901.....	3,351,294	13,861	5,806	4,781,072
To August, 1901.....	7,694,512	38,508	16,759	11,548,192
July, 1900.....	2,783,555	17,470	6,071	4,101,765
To August, 1900.....	8,459,513	59,801	10,163	12,752,246
July, 1899.....	2,557,060	19,208	4,370	4,024,789
To August, 1899.....	6,474,720	45,343	13,319	10,433,807

These comparisons present some rather unexpected figures, especially in pig iron and copper.

The above diminution in iron ore is entirely from old ranges, Michigan and Wisconsin, and is further accentuated by additional decreases from Escanaba, making a total falling off from last year to date of 648,000 tons, while the increase from Minnesota to this time has been 373,143 gross tons, so that the old range decrease has been actually 1,021,000 gross tons so far this season. That this is not due to bad underground outlook at old range mines is shown by the fact that at many places they are clearing additional stock pile ground on surface and are preparing to accumulate a part of their summer hoist above ground, something that has not been done for a long time.

To August 1 shipments from the various upper lake ports have been as follows, with comparisons:

Ports.	1902.	1903.
Two Harbors.....	2,782,298	2,852,659
Duluth	2,634,231	2,745,845
Escanaba	2,546,861	2,144,588
Superior	1,858,487	2,081,981
Ashland	1,786,254	1,434,064
Marquette	1,318,206	1,040,564
Gladstone	46,882	25,942

At the annual meeting of the Lake Superior Mining Institute, to be held on the Marquette range, August 16 and later, the following papers will be read: "Sinking and Equipping No. 9 Shaft, Ashland Mine," by H. F. Ellard, superintendent of the mine; "A Card System for Mine Supply Accounts," by F. W. Denton, manager for the Stanton copper mines; "Titaniferous Iron Ores," by N. P. Hulst, vice-president Oliver and Minnesota Iron companies; "Iron Ore Deposits of Arctic Lapland," by Chase S. Osborne, who has just visited them; "High Explosives: Their Methods of Handling," by J. H. Karkeet, Iron Mountain; "A New Changing House at Cliffs Shaft," by J. S. Mennie; "Materials Other Than Wood for Shaft Linings," by Prof. F. W. Sperr of the Michigan College of Mines; "Champion Mine Intake Tunnel," by F. W. O'Neill, superintendent; "Mine Accounting," by W. M. Jeffrey, auditor Oliver and Minnesota Iron Companies. There may be other papers not yet announced. During the meeting there will be excursions to Munising and Sault Ste. Marie.

New range independent ore producers, with the exception of Corrigan, McKinney & Co., are much ahead of last year. The various Sellwood mines have shipped three times as much ore as to August, 1902; Pickands, Mather & Co. have decreased at one or two properties, but have more than made it up elsewhere; M. A. Hanna & Co. are ahead; Tod, Stambaugh & Co. are ahead of any preceding year; so with the Mohoning and other independents. In some of these instances the improvement is due to new mines, in others, notably Tod-Stambaugh, to heavier shipments from old ones. Corrigan, McKinney & Co., while they have materially curtailed at some mines, have Commodore and Jordan, which at this time a year ago were not shippers, and may not be very far behind.

Three shafts are to be sunk at the new Monroe mine of the Mesaba range, situated in the east half of the southeast quarter of Section 28, 58, 20. Two of these will handle the product from a large milling pit, and the third will open an extensive underground territory. Figures from stripping contractors for the large milling pit are expected shortly, and work will probably be carried on during the coming winter, so that the mine may be a producer another season. It is one of the very large ore deposits of the Mesaba, with all the term implies, and is of a high grade, both chemically and physically. The mine is a very important acquisition to the United States Steel Corporation.

Two important finds are reported on the Mesaba. One is in the southeast quarter of the northwest quarter of Section 25, 58, 17, close to the Howe mine of the Republic Iron & Steel Company, where more than 2,000,000 tons of merchantable ore have been shown this summer. The other is in Section 15, 59, 14, east of the D. & I. R. road, where Adams & McInnis have a number of pits and one drill hole in excellent ore. The drill hole is nearly 50 feet in ore, the pits from 10 to 20 feet, but with indications of continuance. This property Mr. Adams says he and associates will operate themselves. It is becoming more and more apparent to ore discoverers that there is a better thing for them in operating the better grade mines than in selling at the prices that have been obtainable for these grades.

Two diamond drills working in the Atikokan region, on the Canadian side of the boundary, have opened into what seems to be a valuable deposit of sulphur. This is about 150 miles from Lake Superior, at Port Arthur, and on a railroad.

Water in considerable quantity has been cut in the Gibson mine, Menominee range, and the property will be abandoned. Work has been carried on there continuously for four years with sufficient encouragement to warrant continuance, but without much ore at any time. The two shafts have reached a depth of 300 feet. At Great Western, Crystal Falls, where all available stock pile room was occupied, a shovel has been put in the pile and shipments will be more rapid. This mine is now a well equipped property, able to mine ore rapidly and at low cost.

Exploring crews have been put at work in the Waukon, Allamakee County, district of Iowa, where ore has long been known to exist. This work is presumably for the United States Steel Corporation. Assays of ore from Iron Hill deposit there have been as follows: Iron, 58.54, 54.79, 56.76, 54.32, 66.92, 58.68, 47.88; silica, respectively for first three, 4, 5.12, 11.02; phosphorus, 0.13, 0.30, 0.13, 0.503, 0.115, 0.18. An effort is now being made on the part of local people, aside from these explorations, to secure the development of these properties. The ore is a surface deposit, covered with a very light surface, is porous in structure and low in sulphur. Small shipments to Milwaukee have been under way some time. Iron ore not only exists in Allamakee County, but in Dubuque and Delaware counties, all of which lie along the eastern boundary of the State. D. E. W.

The American Furnace & Machine Company, engineers and contractors of Pittsburgh, Pa., builders of furnaces of all descriptions, water seal gas producers and tin plate and sheet mill machinery, have a very large number of contracts on hand at present. This concern are erecting machinery in West Virginia, Indiana, Canada and several places in Pennsylvania. One contract on which they are now working comprises over 20 furnaces and necessary gas producers for same. The company are having a number of inquiries for their J. D. Swindell patent bell coal hopper, and are also receiving large contracts for their patent water seal gas and air valves, and are installing 24 at one plant. They are also installing a large number of special grates in sheet and pair annealing, heating and enameling furnaces. This grate was originally invented for a boiler setting, but it has been adapted to furnaces with satisfactory results. At the present time this grate is being installed under two boilers.

The Buhl Library, presented to Sharon, Pa., by Frank H. Buhl, former president of the Sharon Steel Company, is now nearly completed, and it will be opened soon.

Iron and Industrial Stocks.

Conditions bordering on demoralization prevailed in the stock market for several days during the past week. Two brokerage firms announced their suspension on Wednesday afternoon of last week and this caused the fear that other disasters of the same kind were pending. Consequently continued liquidation took place in both the standard railroad stocks and the industrials. With no further unfavorable developments, the market gradually improved and quite a buoyant feeling set in during the opening days of this week, which did much toward recovering the ground which had been lost. The following quotations show the lowest prices touched on the stocks named during the week, with the prices at noon on Wednesday of this week: American Can, common, 3⅝ to 4⅞; American Locomotive, common, 15⅝ to 17⅝; Colorado Fuel, 40⅛ to 43; Pressed Steel Car, common, 33 to 38; Railway Steel Spring, common, 21½ to 23; Republic, common, 9⅞ to 11⅝, preferred, 59 to 63⅜; Sloss-Sheffield, common, 29 to 33; Tennessee Coal & Iron, 32⅜ to 37½; United States Steel, common, 20⅜ to 21⅞, preferred, 67 to 69½; new 5 per cent. bonds, 76¼ to 77⅝.

The Consolidated Lake Superior Company have extended the time for subscription to the $12,500,000 bonds to August 25.

Dividends.—Niles-Bement-Pond Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15, and a semiannual dividend of 4 per cent. on the common stock, payable one-half September 19 and one-half December 19. For dividend payable September 19 the transfer books will close September 12 and will reopen September 21. For the dividend payable December 19 the transfer books will close December 12 and will reopen December 21.

Pratt & Whitney Company have declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

American Radiator Company of Chicago have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 15.

Blakeslee Forging Company, Plantsville, Conn., have declared a dividend of 1½ per cent.

The Adrian Furnace Blown In.—The Adrian Furnace of the Rochester & Pittsburgh Coal & Iron Company was lighted at noon on the 10th inst. The affair was attended by A. G. Yates, president of the Buffalo, Rochester & Pittsburgh Railway; Lucius W. Robinson, president and general manager of the Rochester & Pittsburgh Coal & Iron Company; Senator Patton of Curwensville, Pa.; Julian Kennedy, Pittsburgh, Pa.; James P. Welsh, general manager of the Fitzpatrick Glass Mfg. Company, Falls Creek, Pa.; A. R. Van Tassel, president of the Union Banking & Trust Company, Du Bois, Pa.; B. M. Marlin, secretary of the Union Banking & Trust Company, Du Bois, Pa.; Hon. W. C. Arnold, Du Bois, Pa.; Eugene Merris of the Merris Beef Company, Du Bois, Pa.; John E. Du Bois, Du Bois, Pa.; Dr. S. M. Free, Du Bois, Pa.; Fred. Lincoln, general manager of the Buffalo & Susquehanna interests, Du Bois, Pa.; Maj. Montrose Barnard, assistant general manager of the Rochester & Pittsburgh Coal & Iron Company, Punxsutawney, Pa.; John Reed, assistant general manager of the Jefferson & Clearfield Coal & Iron Company, Du Bois, Pa., and other prominent citizens of Du Bois. The furnace was lighted by Mrs. A. G. Yates; is situated at Du Bois, Pa., and was designed by Julian Kennedy, engineer, Pittsburgh, Pa. It is 12 feet at the hearth, 19 feet 6 inches at the bosh, 13 feet at the throat and 80 feet high; is equipped with four hot blast stoves, 22 x 80 feet, of Julian Kennedy's design; three high pressure blowing engines built by the Morgan Engineering Company, Alliance, Ohio, and 2500 horse-power of horizontal water tube boilers built by the Aultman & Taylor Machinery Company, Mansfield, Ohio. Thos. W. Kennedy, until recently superintendent of the Isabella furnaces, Etna, Pa., is the superintendent in charge.

E. P. Roberts & Co. of Cleveland, Ohio, consulting engineers, have opened a department of cement engineering, and are now prepared to take charge of the designing and supervision of the construction and operation of cement plants. The cement department opens up a new field, and the services of George S. Perkins have been secured to look after the work. Mr. Perkins is a graduate of Stevens Institute of Technology, class of 1891, in the course of mechanical engineering, and has had an extensive experience in the designing and constructing of cement plants.

CONTENTS.

	Page.
The Hilles & Jones Heavy Plate Planer. Illustrated	1
The Premier Steel Works Dismantled	1
The Light Aluminum Alloys	2
The Providence Steel Casting Company	5
The Lindemann & Hoverson New Factory. Illustrated	6
Official Testing of Steel Tapes	9
Unions in Butte	9
Northern Motors Operating a Milwaukee Turret Lathe. Illus.	10
Fuel Oil	10
Machine for Grinding Twist Drills for Wood Boring. Illus.	11
The Dover Forge & Iron Company	11
A Great Captain of Industry, John Ericsson	12
The Nelson Loose Pulley. Illustrated	13
Holthoff Machinery Company Purchased	13
The Molding Machine. Illustrated	14
The Tallerday Sheet Steel Pipe Connection. Illustrated	18
Production of Tungsten, Molybdenum, Uranium and Vanadium in 1902	19
The Iron and Steel Institute	19
The Philadelphia Molders' Settlement	19
Temperature Reactions in the Blast Furnace. Illustrated	20
Norcross Brothers	21
The Forter-Miller Engineering Company	21
The Lincoln-Williams Twist Drill Company	21
The Republic Iron & Steel Company	22
Structural Steel Officially Defined	23
Editorial:	
How British Trade Is Lost	24
Iron and Steel Stocks	25
Correspondence	25
Personal	25
Notes from Great Britain	26
Obituary	27
Lake Ore Notes	28
Iron and Industrial Stocks	29
The Adrian Furnace Blown In	29
Manufacturing:	
Iron and Steel	30
General Machinery	30
Power Plant Equipment	30
Foundries	31
Bridges and Buildings	31
Fires	31
Hardware	31
Miscellaneous	31
Canadian Bounties in Parliament	32
The Iron and Metal Trades:	
Comparison of Prices	33
Chicago	33
Philadelphia	35
Cleveland	36
Cincinnati	36
St. Louis	36
Pittsburgh	37
Birmingham	38
New York Machinery Market	39
New York	40
Pig Iron Sharply Reduced	40
Metal Market	41
The Boston & Albany Machinists	41
Trade Publications	42
Hardware:	
Condition of Trade	43
Notes on Prices	44
Morley Bros.	45
Trade Items	45
Michigan Retail Hardware Dealers' Association. Portraits	46
British Letter	53
Advertising Advertised. Illustrated	53
Price-Lists, Circulars, &c	54
Movable Platform for Window Floor. Illustrated	54
A Little Experiment in Exporting, But a Very Unsatisfactory One	55
The Salesman and Western Trade	56
Fine Cutlery Sets Leather Cased	56
The Oliver News	56
Remington Arms Company's New Catalogue	57
Thin Decorated Pen Knives. Illustrated	57
Little Giant Stock and Screw Plates. Illustrated	57
Twelve-Tine Safe Edge Fork. Illustrated	57
Combination Clamp and Bench Vise. Illustrated	58
Dixon's Eterno Pencil. Illustrated	58
Heavy Hack Saw Frames. Illustrated	58
Current Hardware Prices	59
Current Metal Prices	66

MANUFACTURING.

Iron and Steel.

At the annual meeting of the stockholders of the Knoxville Iron Company, Knoxville, Tenn., the following officers and directors were elected: W. P. Chamberlain, president; T. I. Stephenson, vice-president and general manager; Otis A. Brown, secretary and treasurer; H. S. Chamberlain, W. H. Vanvenschoten, David Richards, W. S. Mead and E. T. Sanford.

The new blast furnace at Tuscaloosa, Ala., of the Central Iron & Coal Company, 116 Nassau street, New York, was blown in August 6.

Reports from Monterey, Mexico, state that the plant of the Monterey Iron & Steel Company is now in full operation, the rolling of steel rails having been commenced last week. It is stated that the company have on hand orders from several of the Mexican railroads for a large tonnage of rails.

On Tuesday, August 11, the first steel was made at the new basic open hearth department of the Harrisburg Pipe & Pipe Bending Works, Harrisburg, Pa. Within a month another furnace will be put in operation. A third will be operated before the beginning of winter. The rolling mill and the new pipe department will be started as soon as the new furnaces produce enough steel to keep them in operation.

Paxton blast furnace No. 1 at Harrisburg, Pa., will be blown out for repairs this fall, it having been in constant operation for three years without a break.

The Central Iron & Steel Company of Harrisburg, Pa., will be unable to operate their new open hearth department this year, owing to delayed shipments of material and a fire at the works, but expect to have it in operation by early spring.

The puddle mill of the Structural Tubing Works, Danville, Pa., was started on Monday, August 10, after a shutdown of several weeks.

The Temple blast furnace of Reading, Pa., which went out of blast six weeks ago for repairs, has resumed operations.

The Eastern Steel Company have purchased 15 lots adjoining their new plant in Pottsville, Pa., and it is understood will further enlarge the mills there. The course of a creek is to be changed and a new gas generator built. Work on two of the open hearth furnaces has been almost completed.

The Eleanor Iron Works of Hollidaysburg, Pa., expect to resume operations with large orders after September 1, the mills having been operated with frequent interruptions for some time.

Reports from Montreal, Canada, state that the Londonderry Iron & Mining Company have about completed their plant, and expect to begin active operations around September 10. At that time their furnace is expected to be ready to be blown in.

General Machinery.

The Diamond Machine Company of Providence, R. I., have bought the disk grinder business of the George Gorton Machine Company of Racine, Wis., and will conduct it at Providence in conjunction with their present line of grinding machinery. The purchase does not include machinery, the Gorton Company intending to continue their plant at Racine in other lines of machinery. The Diamond Machine Company, who are practically identical with the Builders Iron Foundry, acquire all patents, drawings, patterns, &c., of the Gorton disk grinders, which include more than 20 different machines.

The Brown & Sharpe Mfg. Company of Providence, R. I., have been shut down for a summer vacation from August 1 for two weeks. The time has been employed in making thorough repairs and general improvements.

The Draper Machine Company of Hopedale, Mass., are largely increasing their wood working department. Three stories are being added to a one-story building 108 x 240 feet.

The stockholders of the Baker Mfg. Company of Tarentum, Pa., with offices in the Park Building, Pittsburgh, held a meeting August 3 and elected the following directors: H. W. Armstrong, H. M. Breckenridge, J. D. Wilson, J. W. Hemphill, O. C. Camp, F. H. Skelding and Alfred Hicks. A semiannual dividend of 3 per cent. was declared.

Wood working machinery is required by Henry H. Behrens, 944 North Thirty-first street, Camden, N. J., who is to establish a yard at the foot of Twenty-ninth street for the building and repairing of tug boats, barges and lighters. The plant is to be known as the East Side Boat Yard and Dry Dock.

A large addition is to be made to the plant of the Lancaster Machine & Knife Works, Lancaster, N. Y. The new building will be of brick, two stories high. A new gas furnace for tempering knives has been added.

The business of L. S. Heald & Son, Barre, Mass., manufacturers of grinding machinery, will be removed to Worcester, Mass., and will be combined with the Morgan Motor Company and will occupy the shop of the motor company at Barbears Crossing. The Morgan Motor Company will abandon the manufacture of steam trucks. Charles H. Morgan, president of the Morgan Construction Company and Morgan Spring Company, has taken an interest in the Heald business, which will be incorporated under Massachusetts laws, the name of Heald to be retained in the corporate name. The manufacture of the Heald grinding machines will be continued and the lines largely extended. The Morgan Motor Company shop was built less than two years ago and is admirably adapted to the new purpose. The building contains 12,000 square feet of floor area and has a traveling crane covering the space under its main span and serving the machine tools in the two bays. Ralph L. Morgan retains the patents of the heavy motor truck built by the motor company, which may be manufactured elsewhere.

The American Frog & Mfg. Company, Kansas City, Mo., have completed the buildings for their machine shops, forge shops, pattern shops and engine and boiler room at their plant at Nineteenth and Manchester avenues. The machinery is now being installed. The floor space of the machine shop is 15,000 square feet and the forge shop 10,000 square feet.

The Hussey Drop Forge & Mfg. Company of Cleveland are now occupying their new factory on Axtell street, that city. The layout includes a hammer shop, 50 x 75 feet, and a tool and assembling room, 50 x 68 feet. The company are supplying forgings to a very large proportion of the automobile manufacturers of the country, besides securing some very good business from machinery manufacturers. They are supplying the Acme Mfg. Company, Cleveland, with 30,000 forged pieces, the National Acme Mfg. Company with 5000 pieces, and the Winton Motor Carriage Company with 16,000 parts. They are also supplying to order a number of specialties for various manufacturers. They are installing a 2000-pound steam hammer.

George H. Bowler & Co. of Cleveland, dealers in second-hand machinery, are disposing of the general machine shop equipment of the factory of the Spencer Automatic Machine Company of Hartford, Conn. They are also disposing of a number of forging machines used by the Vulcanus Forging Company of Cleveland.

The Warner & Swasey Company of Cleveland, manufacturers of machine tools and telescopes, are receiving bids for the erection and equipment of a factory addition, 50 x 203 feet, to be located adjoining their present plant on the Pennsylvania Railway tracks, that city. The Osborn Engineering Company are preparing the plans for the building.

The Cleveland Gear Works of Cleveland have moved into new quarters at 35 Michigan street, where they will have increased facilities and a better location. They will add to their equipment.

Local creditors of the Standard Motive Power Company of Canal Dover, Ohio, have filed application for the appointment of a receiver for the company. The creditors asked to have Theodore Wentz of the First National Bank, Canal Dover, and Harry Hostettler, also of Canal Dover, appointed as the receivers. The company are capitalized at $10,000,000, and were organized about a year ago by Howard McNutt and Waldo Morse of New York. They proposed to manufacture locomotives, utilizing the patents of Arthur P. Dodge. A site of 60 acres was secured at Canal Dover and nearly $100,000 have been expended and contracts amounting to $500,000 have been let. The financial embarrassment is said to have been due to the refusal of a securities company at Pittsburgh to accept a large block of bonds which they had subscribed. It is announced that there will be no cessation of work, and it is generally believed that the plant will be completed and the plans of the company carried out.

Power Plant Equipment.

Practically all of the equipment has been purchased for the new plant to be erected at Toledo, Ohio, by the S. M. Jones Company. There will be an engine shop, 75 x 260 feet, with two bays, and a foundry, 100 x 140 feet. Both buildings will be equipped with 15-ton electric traveling crane, and all machinery will be operated by electricity. Power will be furnished by an 80 horse-power vertical double cylinder gas engine direct connected to generator and a 150 horse-power horizontal tandem double acting, double cylinder gas engine, both of the company's own make. The output will be gas and gasoline engines.

The Peterborough Hydraulic Power Company, of which Senator Geo. A. Cox is president, are building a new power plant on the Otonabee River in the town of Peterborough, Ontario, Canada, which will be equipped with the following apparatus recently purchased from the Westinghouse Electric & Mfg. Company: A 1500-kw., 2240 volt generator, having 7200 alternations and running at 150 revolutions per minute, to be direct connected to water wheels; also two 125 volt, D.C., direct coupled exciters of 75-kw. capacity each; together with switchboard consisting of a large generator panel and two exciter panels. This power house, when completed, will be an unusually fine one and is to furnish power to the Peterborough Mill of the American Cereal Company, owned by the Quaker Oats Company. Power will be supplied to several other manufacturing plants in the town and to the Peterborough Light & Power Company.

The Board of Trustees of Schuylerville, N. Y., will receive bids until August 27 for the construction of water works, including a gasoline engine and triplex pump of 400 gallons capacity per minute.

Bids are asked until August 25 for constructing water works at Gulfport, Miss. A 2,000,000 gallon compound duplex pump, cast iron pipe, castings, &c., are required.

The Baxter engine, which was formerly manufactured by the Colt Patent Fire Arms Company of Hartford, Conn., is to be built in Buenos Ayres, the patterns, drawings, &c., having been purchased by Kates & Bok of New York, acting on behalf of an Argentine manufacturer. The engines will be built for installation in small industrial plants.

The recently organized White-Blakeslee Mfg. Company, Birmingham, Ala., have absorbed the entire interests of the Blakeslee Mfg. Company, builders of gas and gasoline engines, power pumps, well drilling machinery, &c. The officers are: C. B. White, president; Jas. Bowron, vice-president; J. B. Scully, secretary, and R. E. Lockett, treasurer.

The Almy Water Tube Boiler Company of Providence, R. I., are building a pair of boilers to develop 600 horse-power each at natural draft for a new steamer of the Fisher Island Navigation Company; a pair of boilers of 300 horse-power each for a Long Island Railroad Company tug, and an 80 horse-power boiler for the Atlantic Rubber Company of Providence.

The Harrisburg Foundry & Machine Company, Harrisburg, Pa., will make the engines for the large power plant of the new capitol building now being erected at Harrisburg, Pa. The engines will be six in number and will be of the type known as the Harrisburg Standard, each machine to be handsomely finished. They will aggregate 200 horse-power. The company are now turning out several engines for Mississippi's capitol at Jackson.

W. H. Davis, Emmett, Idaho, advises us that he will require a 100 horse-power water wheel and all the electrical machinery for a complete light and power plant of about 75-kw. capacity. It is proposed to start work very soon on the plant, which will cost about $25,000.

The new Manomet Mill at New Bedford, Mass., will require a 3000 horse-power engine, the contract for which has not been let.

The Corliss Engine Works, Philadelphia, Pa., will erect a new machine shop, 78 x 145 feet, with boiler house, 30 x 39 feet. No new machinery will be purchased except the boiler, which has been arranged for.

Boyts, Porter & Co., Connellsville, Pa., are building additions to their steam pump works, which will greatly increase the capacity. These consist of a new foundry, 40 x 100 feet; machine shop addition, 16 x 74 feet, and a stock and pipe cutting room, 100 x 150 feet. Considerable new machinery is being installed, including 150 horse-power of boilers and engines.

Foundries.

The National Steel Foundry Company, New Haven, Conn., have let the contract for the construction of their plant. Every effort will be made to have it in operation by January 1.

The Standard Foundry Company, Buffalo, N. Y., recently incorporated, have commenced operations in their new plant on Mississippi and Elk streets, adjacent to the Lackawanna tracks.

The American Ship Windlass Company of Providence, R. I., have their new foundry well advanced towards completion. The high and exceedingly well lighted building, 105 x 155 feet, is ready for occupancy. The 10-ton electric traveling crane is in place and the furnace is being set up. The Whiting Foundry Equipment Company of Chicago furnished the furnace and crane. All machinery in the foundry will be motor driven.

The Montrose Iron & Steel Works, Frederick, Md., recently incorporated with a capital stock of $25,000, are erecting a plant for the manufacture of gray iron castings. The foundry will have a frontage of 125 feet, and the machine shop will be 40 x 80 feet, two stories. The equipment will shortly be installed and it is expected that the plant will be in operation early in September. W. T. S. Diven is secretary.

The National Malleable Castings Company of Cleveland are preparing to erect a large factory building and storehouse. It will be of brick and two stories high.

The Forest City Foundry & Mfg. Company of Cleveland, now located at Elm and Winslow streets, that city, have purchased a large building site on the Lake Shore & Michigan Southern tracks west of the city and are planning to erect a new plant.

Bridges and Buildings.

The Southern Structural Steel Company, San Antonio, Texas, recently incorporated with a capital stock of $100,000, are equipping a plant for general iron and steel work. For the present the company will pay particular attention to jail work. The officers are: D. F. Youngblood, president; J. A. Youngblood, vice-president, and G. L. Youngblood, secretary and treasurer.

Fires.

The planing mill of C. A. Hooper & Co., San Francisco, Cal., was destroyed by fire August 5. The loss is over $100,000.

The Bellaire Boiler & Bridge Works, Bellaire, Ohio, were recently destroyed by fire, causing a loss of $10,000.

The shops of the Enterprise Boiler Company, Youngstown, Ohio, were burned August 7. The loss is placed at $50,000.

The blacksmith and boiler shops of the Missouri, Kansas & Texas Railroad Company at Parsons, Kan., were demolished by a tornado August 8.

The plant of the Little Rock Mill & Elevator Company, Little Rock, Ark., was burned August 6, entailing a loss of $75,000.

The main building of the Piqua, Ohio, plant of the American School Furniture Company was destroyed by fire August 6. The loss is placed at $50,000.

Hardware.

At a meeting of the stockholders of the Hawley Time Register Company, Syracuse, N. Y., held on the 7th inst., the following directors were elected: Charles N. Crouse, Douglas N. Green, Thomas Hunter, H. McMurchy, Fred Frazer, J. M. Ellis, H. W. Duguid, J. P. Goettel and W. D. Hawley. The officers for the ensuing year will be chosen from the above at a later date.

The Hendricks Mfg. Company of Waynesboro, Pa., have leased a building and have commenced the manufacture of the Hendricks patent automatic sash lock and hinge.

The Parker Wire Goods Company, Worcester, Mass., are about to increase their capital stock from $10,000 to $15,000. They have taken 3000 square feet of additional floor space in the Colvin Building, which they occupy in part.

The Dey Patents Company, Syracuse, N. Y., manufacturers of the Dey time register, have commenced work on a new factory in South West street. When it is completed it is stated that the new plant will give employment to about 300 men.

The Yost Electric Mfg. Company, Toledo, Ohio, have increased their capital stock from $75,000 to $200,000, in order to take care of their rapidly increasing business. Most of this increase will be taken up by the present stockholders. Although the company completed a new factory to enlarge their capacity only last May, it is found necessary to again increase the output on the Yost sockets. A number of new articles will also be added to the line.

The Haldeman-Crossley Company, recently organized at Defiance, Ohio, to manufacture feed cutters, blacksmiths' tools, butchers' supplies, band saws and other small tools, have purchased a factory in Defiance, and expect to have it equipped and in operation within 90 days.

The Bundy Time Recording Company, Syracuse, N. Y., who were recently capitalized at $500,000, have purchased the Olive Wheel plant, and will use it as the nucleus of a factory to manufacture time recording and calculating machines. When things are well under way the new company will employ 200 men.

Annual Wind Clock Company have purchased a commodious factory at Middletown, Conn., and are just now engaged in moving in machinery and fitting up the plant for the manufacture of their clock. The company intend to manufacture a spring pendulum clock which will run a year on one winding and keep correct time. They expect to make a finer movement than any on the market at the present time. The company hope to have their machinery installed and the plant in full operation so as to be in a position to take orders for the holiday trade of this year. The officers of the company are H. D. Mildeberger, president: C. A Bowles, secretary and treasurer, and Charles A. Jewell, vice-president.

Miscellaneous.

The Henry S. Mould Company, Empire Building, Pittsburgh, have received a contract from the Descubridora Mining & Smelting Company, New York, for a briquetting plant for installation in the company's Mexican mines. The plant will have a capacity of 50 tons per day.

The receiver for the American Motor Carriage Company of Cleveland states that the company are to be reorganized and that they will soon be in shape to renew the manufacture of gasoline automobiles on a considerably larger scale than heretofore.

The Pittsburgh Cast Iron Brazing Company, Allegheny, Pa., have just completed a new plant for the brazing of cast iron machinery. They request inquiries from the trade for this class of work.

The plant of the Atlanta Terra Cotta Company, which is now under erection at Atlanta, Ga., consists of a main shop, 72 x 200 feet; mill room, clay shed, plaster shop, fitting and shipping buildings, 50 x 100 feet each, kilns, and several smaller buildings. The equipment throughout will be modern.

The Providence Belting Company, Providence, R. I., are manufacturing a new line of water proof belting for use in damp places. It is said that severe tests have demonstrated the excellence of the water proofing methods applied, and also that the belt has unusual "hugging" qualities.

The Edna Smelting & Refining Company, Cincinnati, have erected a new shop, 100 x 280 feet, for the production of a line of injectors, lubricators, valves, &c., in addition to their other specialties, which will be ready for the market in about 60 days. A new Babbitt metal and spelter department has just been completed and an oil fuel system for melting furnaces will also be installed. Other additions are in contemplation for the near future. The company will require considerable new brass working machinery, such as lathes, drills, &c.

Canadian Bounties in Parliament.

TORONTO, August 10, 1903.—On Tuesday Mr. Fielding's resolutions respecting bounties on iron and steel were passed by the House of Commons and a bill founded on them received its first reading. There was considerable discussion. In moving the House into committee to consider the resolutions, the Finance Minister reviewed somewhat the history of bounty legislation, referring to facts that have already been noted in these columns. The total amount in iron and steel bounties paid in the last fiscal year, he said, was $1,098,359. The proposed bounties on steel rolling mill products might, he said, fall short of the expectations of some people, but on the whole he thought they would turn out satisfactory. The bounties on structural material apply only to those weights per yard that are subject to a low duty, one of 10 per cent. He stated that the imports of wire rods in the last fiscal year amounted to 55,182 tons, valued at $1,523,792, and of structural forms there were imported 47,512 tons. The value of the heavy angles so imported was $789,644, and the value of the plates imported was $571,291. If one-third of these quantities were manufactured in Canada the bounty thereby earned would be $150,000. As it will take some time for mills to be prepared for turning out the products on which the new bounties apply, Mr. Fielding thought it unlikely that their output during the next twelvemonth would exceed one-third of the last year's imports. It had been considered inexpedient, he stated, for the bounties on rolled products to be limited to a period of five years or any other limit, as in the case of the pig iron and billet bounties, because such a definite arrangement would, in a sense, be a contract, and the Government does not at the present time wish to have its action trameled by engagements extending far into the future. It wished to be free to deal with the question at any time that a tariff revision might be decided upon. Early in the session it was concluded, the Minister explained, that a change in the duty upon these basic materials would involve other important changes in the tariff which the Government did not think advisable to make. Hence the bounty plan was decided upon. It is quite possible, he said, that the bounties may be replaced by duties, though on that point he did not wish to be understood as making any intimations one way or another.

In reply, Mr. Borden, the leader of the Opposition, also traversed the history of the bounties, though from a Conservative standpoint. Of the principle, as applied to the rolled products, he spoke with disapproval.

The present system, Mr. Borden declared, was a mere expedient and makeshift. The iron business of Canada could never be put upon a permanent basis until the tariff was so readjusted as to secure the home market to the Canadian manufacturers. He objected to the bounty system because it did not secure the home market. Customs duties only could secure this market, and in that way build up production in Canada. The result would be that by the competition stimulated in our own country prices would be reduced to a reasonable limit, and the people would get the products at such fair prices that eventually there would be no burden to the people at all; the effect of the bounty system was exactly the opposite. The more the bounty system encouraged development, just to that extent would the burden upon the people be increased. The value of the home market was shown by the fact that last year Canada used over 800,000 tons of iron and steel, of which she imported 544,548 tons. Surely some opportunity should be afforded our manufacturers to acquire so valuable a home market. During the last year Canada had imported $33,681,625 of iron and steel products—surely a considerable portion of that could be manufactured in Canada—but this could only be secured by a protective tariff, not by the granting of bounties.

Mr. Borden gathered from Mr. Fielding's remarks that he was figuring on a tariff revision. This, he thought, should be done at once without resorting to bounty makeshifts, which could not put the industry upon a permanent basis. He did not know whether Mr. Fielding had any understanding with the iron and steel manufacturers, but the way he had dealt with the matter in the House would seem to give color to that supposition. While Mr. Borden was glad to see this small measure of protection given to aid this great industry, he still regretted that Mr. Fielding had not seen fit to adopt the only means of putting it upon a permanent basis. He trusted the Government would at the earliest opportunity realize that the present policy was only a makeshift, and that in order to properly encourage the iron and steel business it was necessary to have a revision of the customs tariff with regard to this and other associate industries.

Mr. Tarte, who until last year was a member of the present Government, also thought the bounties less effective than protective duties. He said that once more the Government was not doing the right thing. Mr. Fielding was asking for a large amount of money to pay into the hands of iron and steel manufacturers. He was not doing that because he was convinced that protection was a good policy, but simply because his trade policy had nearly forced some industries to the wall, and he simply gave relief because he could not help himself. The Government was constrained now to do what at the beginning of the session they declared they would not do. He was glad that public opinion had compelled Mr. Fielding to do something, although it was not the right thing. It was a policy of piecemeal—a "retail policy."

Mr. Tarte was glad to share the views of the leader of the Opposition in congratulating Mr. Fielding upon doing something. He proceeded to read a statement sent him by a New York steel manufacturer, to the effect that the American Steel & Wire Company since the taking off of the duty by the Liberals had gained complete control of the Canadian market.

Last year Canada imported some 31,000 tons of wire, of which 27,000 tons came from the United States and 3500 were made in Canada. Every year the price of Canada was fixed by the American Trust, and even the products of the Canadian factories had to be quoted f.o.b. Cleveland. That was a fine state of affairs.

He asserted that before the duty was taken off there were 30 steel wire factories in Canada, and with proper protection Canadians could secure cheaper wire made at home than was now accorded them by the American trust. The free traders were utterly inconsistent. They had cheered when the duties were taken off, and when a duty of 35 per cent. was imposed they cheered again.

Mr. Tarte proceeded to compare the prices of a number of iron and steel wares in the United States with the same articles in Canada under a duty of 35 per cent., the price in every instance being much lighter in the United States. As soo, however, as the duty was removed the Americans first slaughtered our manufacturers with cheap goods and then raised the prices to the American level. Mr. Fielding had said that over $30,000,000 had been paid for iron and steel products. If, instead of bounties, there had been a protective duty of 35 per cent., that money would not have gone out of this country, but would have been spent here to the benefit of every class of the community.

Mr. Kemp, who is head of the Kemp Mfg. Company, Toronto, objected to the bounty method. Wire, he said, for the manufacture of wire nails, is being imported from the United States. Should the manufacturers there at any time say, "We will not sell the wire; we will sell you the nails," the nail factories of Canada would go.

Mr. Paterson, Minister of Customs, said the bounty system was a wise one, because it accomplished a specific object. He claimed that since the abolition of the duty on steel rods, which were not made in Canada, the price of wire nails had come down from $1 to 60 cents a keg.

C. A. C. J.

Contracts have been let to the O'Rourke Engineering Company of New York for the work of depressing the main tracks of the New York Central tracks from Fifty-seventh street south so as to open all the cross-town streets to traffic at the street level.

The Philadelphia & Reading Railway Company will begin shortly the building of locomotives at their shops in Reading, Pa. The first order is for five class D 3-H machines. Heretofore only repair and overhauling work has been done at Reading.

The Iron and Metal Trades.

Our monthly blast furnace statistics show a number of interesting features. Conspicuous among them is the fact that the July production of anthracite and coke pig iron was only 1,550,340 tons, which is a falling off of 123,000 tons as compared with June, when the product was 1,673,000 tons. If the fact be taken into account that the latter is a month of 30 days the decline amounts to over 150,000 tons. This is due partly to the fact that, generally speaking, the furnaces have not been doing well, a common occurrence in midsummer, and partly to the fact that a considerable number of furnaces have either blown out or have been banked on account of labor troubles. The adjustment of the latter would of course cause a return to larger output, but as it is we entered the month with a capacity of 352,554 tons a week, contrasted with a maximum of 387,725 tons on June 1. To this reduction in the supply of domestic Pig Iron must be added the imminent cessation of imports.

As an offset, the fact must be considered that stocks of Anthracite and Coke Pig Iron increased in July by about 76,000 tons, the natural result of the deadlock between buyers and sellers which has been going on for so long a time. It is impossible to state to what extent this increase in stocks, in the face of light production, has been due to the course almost universally pursued on the part of founders of baring their yards and relying upon the furnaces to make quick deliveries.

The firm attitude of the Southern association furnaces in holding to prices while being undersold in all quarters is beginning to bring up the question whether after all their patient waiting may not be rewarded by a surrender to them. The other producers have taken a good deal of business, and may show a disposition to withdraw for the present.

During the week large interests in the Chicago market have purchased very considerable quantities, upward of 60,000 tons, more than one-half going to Northern furnaces. In other markets more interest has been shown and the undertone is better.

Very little is being done in Bessemer Pig. The Pig Iron Committee of the United States Steel Corporation had a meeting yesterday, but did not recommend any purchases, although, according to estimates, from 75,000 to 100,000 tons of Bessemer Pig will have to be bought to cover the requirements of the Steel works to the end of the year.

In the Finished Iron and Steel markets there is little life, and even in those branches in which the activity has been most pronounced there is a disposition to shade prices a little. New tonnage is not coming in to keep up extraordinary record of orders of the spring and early summer.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.12, 1903.	Aug.5, 1903.	July15, 1903.	Aug. 13, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$16.75*	$17.25	$17.75	$22.00
Foundry Pig No. 2, Southern, Cincinnati	*15.25*	15.25	16.25	20.25
Foundry Pig No. 2, Local, Chicago	*17.25*	17.25	18.00	22.00
Bessemer Pig, Pittsburgh	18.85	18.85	18.85	21.50
Gray Forge, Pittsburgh	*16.00*	16.15	18.25	20.50
Lake Superior Charcoal, Chicago	*21.00*	21.50	22.00	26.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	27.00	27.00	27.00	31.25
Steel Billets, Philadelphia	*28.00*	28.25	29.00	28.75
Steel Billets, Chicago	*28.00*	28.00	29.50	31.00
Wire Rods, Pittsburgh	*35.00*	35.00	35.50	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*16.50*	17.00	17.00	18.50
O. Steel Rails, Philadelphia	*18.00*	18.75	19.25	21.00
O. Iron Rails, Chicago	*18.50*	18.50	20.00	24.50
O. Iron Rails, Philadelphia	*19.50*	19.50	22.00	24.00
O. Car Wheels, Chicago	21.50	21.50	21.50	21.00
O. Car Wheels, Philadelphia	*19.00*	19.50	20.00	20.00
Heavy Steel Scrap, Pittsburgh	*19.00*	19.00	20.00	....
Heavy Steel Scrap, Chicago	*15.00*	15.50	16.50	18.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.55*	1.65	1.65	1.95
Common Iron Bars, Chicago	*1.60*	1.60	1.65	1.80
Common Iron Bars, Pittsburgh	*1.60*	1.65	1.65	1.80
Steel Bars, Tidewater	*1.70*	1.70	1.75	2.00
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	1.78	1.78	1.75	2.00
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Beams, Tidewater	1.73½	1.73½	1.73½	2.35
Beams, Pittsburgh	1.60	1.60	1.60	2.00
Angles, Tidewater	1.73½	1.73½	1.73½	2.35
Angles, Pittsburgh	1.60	1.60	1.60	2.00
Skelp, Grooved Iron, Pittsburgh	*1.82½*	1.85	1.85	2.10
Skelp, Sheared Iron, Pittsburgh	*1.90*	1.90	1.95	2.15
Sheets, No. 27, Pittsburgh	*2.60*	2.60	2.65	2.90
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	*13.00*	13.00	13.67½	11.60
Spelter, St. Louis	5.45	5.50	5.45	5.20
Lead, New York	4.12½	4.12½	4.12½	4.10
Lead, St. Louis	*4.05*	4.15	4.12½	3.97½
Tin, New York	**28.25**	28.25	26.90	27.87½
Antimony, Hallett, New York	*6.00*	6.00	6.50	8.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

Chicago.

FISCHER BUILDING, August 12, 1903.—(*By Telegraph.*)

The active buying of Pig Iron a week ago has continued, the tonnage of the past week almost approximating that of the previous week. The largest purchaser has been the International Harvester Company. It is estimated that they have purchased 60,000 tons, divided between Northern and Southern furnacemen, and there are now pending negotiations with producers for additional blocks which may be closed within a few days. Mention was made a week ago of a portion of this large purchase. Additional purchases have since been closed. The active buying by the implement interests has not been confined to Pig Iron, but during the past week they have bought also various lots of Finished Material. There has been a good trade in Foundry Irons besides that of the International Harvester Company. In quantities ranging down from 5000 tons a number of Western foundrymen have negotiated for the Iron they expect to need for the ensuing six or nine months, the total business being the largest in Foundry Irons for any week this year. In Malleable Irons also there has been a continuance of the activity of the previous week, not in so large quantities, but enough to make the buying notable. The aggregate purchases have probably reached 70,000 tons. In almost all other branches of the trade buyers have not yet broken away from the chronic policy of purchasing for their immediate needs only. This hand to mouth buying makes a moderately good aggregate, but scarcely up to the needs of the mills. The better reports come from the jobbing houses, where the orders are said to be representative of a normally good consumption of Iron and Steel throughout this territory. There are no changes in prices to note, ex-

cept for Old Material, which is declining on small inquiry and imparting to the Iron Bar trade a corresponding tendency toward a lower level.

Pig Iron.—The Southern association furnaces are maintaining openly their old schedule of prices based on $13.50, Birmingham, for No. 2. Trading at that level is meager. Most of the business closed this past week has been between $12 and $12.50. The nonassociation furnaces have taken considerable tonnages well up into next year, and there are occasional evidences that they have oversold, but the bulk of the trading has been in Northern Irons. Local No. 2 is quoted at $17.25 and upward, but large lots have been sold at a concession. The selling of the past week or two has put some of the Northern Foundry furnaces into a position of semi-independence. They are now well booked for months to come and they have taken the business so close to what they regard as cost that the orders are accepted with little enthusiasm. The market for Northern Irons is developing in consequence a certain firmness, to which it has been a stranger for many months. But the situation in Southern Irons is more uncertain. There are conflicting stories about the probable action of the associated furnaces, and the marked difference between the actual selling prices of outside concerns and the price adhered to by the large companies leaves plenty of play for developments. The two must meet on some level before the situation becomes entirely clear. It is said that implement people have bought 25,000 tons of Southern Iron, most if not all of it going to the outside producers. The query that engages attention here is whether the outside furnaces will become so well filled with orders that they will in self defense rise to $13.50 or whether the associated interests will make the descent. This uncertainty may delay some transactions, but for Northern Irons the inquiry has gained in width this week and the attitude of the buyers has become one of close attention to the market conditions. Among purchases made last week were one of 3000 tons of Malleable by a Michigan consumer and a lot of 5000 tons by another Malleable foundry. There was sold one lot of 3000 tons of local Foundry Iron. One contract was for 1000 tons of Southern Foundry No. 2 at $12.25, and another for 300 tons at $12. In lots of from 300 to 500 tons a fair business was done. There is promise of continued activity in Northern Irons in the near future. Approximate prices on cars, Chicago, are as follows:

Lake Superior Charcoal	$21.00 to $22.00
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Local Scotch, No. 1	19.00 to 19.50
Ohio Strong Softeners, No. 1	19.00 to 19.50
Ohio Strong Softeners, No. 2	18.50 to 19.00
Southern Silvery, according to Silicon	19.10 to 20.00
Southern Coke, No. 1	17.10 to 17.85
Southern Coke, No. 2	16.60 to 17.35
Southern Coke, No. 3	16.10 to 16.85
Southern Coke, No. 1 Soft	17.10 to 17.85
Southern Coke, No. 2 Soft	16.10 to 16.85
Foundry Forge	15.60 to 16.35
Southern Gray Forge	15.10 to 15.85
Southern Mottled	14.60 to 15.35
Southern Charcoal Softeners, according to Silicon	20.85 to 21.85
Alabama and Georgia Car Wheel	25.85 to 27.85
Malleable Bessemer	18.00 to 18.50
Standard Bessemer	18.25 to 18.75
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	20.80 to 22.80

Bars.—There has been more activity in Steel Bars than for several weeks. The buying is for annual or semiannual requirements and includes the wants of a number of consumers. The prices of Steel Bars have firmed up. One mill, which had offered product at a concession of $1 a ton, has withdrawn that offer; one lot of 400 tons was sold at a slight reduction. Users of Bars are usually restricting their purchases to moderate quantities, repeating their orders as fast as necessary. The average price of Iron Bars is slightly lower, but there is no quotable change. The following are the official prices, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.60c. to 1.65c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.06½c. to 2.16½c.; Bessemer Bands, 1.76½c. to 1.86½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. For merchant trade the market has remained steady at the following prices: Bar Iron, 2c. to 2.15c.; Soft Steel Bars, 2c. rates; Angles, under 3 inches, 2.10c. rates, and Hoops, 2.40c., base, from store.

Structural Material.—Publication by the local press of alleged combinations among various contractors in the building trades to charge exorbitant prices for work has not helped the demand for Shapes, and the building outlook is flat for the city proper. About the only life discernible is the preparation for the construction of a North Side hotel, which may consume 800 to 1000 tons of Structural Material. Store trade is fairly good. We quote as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. From local stocks prices are nominally unchanged, as follows: Beams and Channels, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

Plates.—There is continued activity at the Western mills, but the work is being done on specification on old orders; comparatively little new business is developing. Prices are without change and are as follows, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. From local warehouses prices have remained steady, as follows: Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16-inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.; Flange Steel, 2.40c. to 2.50c., all f.o.b. warehouse, Chicago.

Sheets.—Inquiry for Black Sheets shows improvement. There is no further concession in prices, but the concessions from circular prices previously noted have not disappeared. Some of the smaller mills are in the market with product and are pushing trade. Prices of Black Sheets, however, have remained unchanged, f.o.b. cars, Chicago, mill shipment, as follows: No. 10, 2.06½c. to 2.16½c.; No. 12, 2.16½c. to 2.26½c.; No. 14, 2.26½c. to 2.36½c.; No. 16, 2.36½c. to 2.46½c.; Nos. 18 and 20, 2.50½c. to 2.60½c.; Nos. 22 and 24, 2.60½c. to 2.70½c.; No. 26, 2.70½c. to 2.80½c.; No. 27, 2.80½c. to 2.90½c.; No. 28, 2.90½c. to 3.00½c. The demand for shipment from local stocks has been met at from 10c. to 15c. over mill prices. Galvanized Sheets have also been slow and easy at 75, 10 and 5 to 75, 10 and 7½ discount, mill shipments. Small lots from local stocks are sold on the basis of 75 and 5 to 75, 5 and 2½ discount.

Cast Iron Pipe.—Trade for Cast Iron Pipe shows improvement, but it is in small lots. There has sprung up in various parts of the West a livelier interest, and from inquiries received the volume of business may increase. The following are the quotations current, f.o.b. cars, Chicago: 4-inch, $31; 6-inch and larger, $30 for Water, and $1 higher per ton for Gas Pipe.

Billets.—Practically nothing has been done in Billets this week. There has been some interest shown in the market by prospective buyers, but the trade on the whole is sluggish. Forging Billets in small lots are held at $33 and higher.

Merchant Pipe.—For all sizes there is much the same steady trade that has been current for months. The mills are running fully and the present volume of orders is ample. Prices are firm at the regular schedule of discounts, which are as follows for carloads, Chicago, base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inch	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—Both from mill and store there is reported this week a satisfactory trade in Tubes. The mills continue to make slow shipments. Following is the schedule of discounts:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	55.85	35.85
2¾ to 5 inches	60.85	45.85
6 inches and larger	55.85	35.85

Less than carloads, 12½ per cent. advance.

The following is the schedule of discounts for shipment from local stocks:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	..

Merchant Steel.—Further improvement in the buying of Merchant Steel is made on contract business. Each week sees a somewhat wider inquiry, and orders are being closed more easily. Transactions this week aggregated several thousand tons, the buyers being implement manufacturers. Prices are firm at previous quotations, as follows, mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—Little business in Rails for 1904 shipment is to be chronicled this week. For delivery this year there has been a moderate trade, though there have been no transactions of large tonnage, purchases usually running from a few hundred to 1000 tons. Standard Sections are quoted $28 and Seconds $27, mill shipment. Light Rails are quoted at $34 to $38. Prices for Track Supplies are unchanged, as follows: Splice or Angle Bars, 2c. to 2.10c.; Spikes, 2.10c. to 2.15c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 2.90c.; with Hexagon Nuts, 3c. to 3.10c. From store 10c. to 15c. over mill prices are asked and obtained.

Old Material.—There is great diversity in the price of Relaying Rails. The relative location of the inquiry and of

the Rails to be sold is all important. There are stocks of Old Rails stored in certain parts of the country waiting an inquiry in that territory, and again in some recent transactions Rails have been transported half way across the continent. For Scrap used in rolling mills there is an easier condition this week because of a light demand, and an uneasiness among some holders. A weakening of demand for Melting Steel in the East has impaired the values of that grade here also. Generally the market is not strong. The following are the prices current per gross ton, f.o.b. cars, Chicago:

Old Iron Rails	$18.50 to $19.00
Old Steel Rails, mixed lengths	16.50 to 17.00
Old Steel Rails, long lengths	19.00 to 19.50
Heavy Relaying Rails	29.00 to 31.00
Old Car Wheels	21.50 to 22.00
Heavy Melting Steel Scrap	15.00 to 15.50
Mixed Steel	13.00 to 14.00

The following quotations are per net ton:

Iron Fish Plates	$15.50 to $16.00
Iron Car Axles	19.50 to 20.00
Steel Car Axles	18.50 to 19.00
No. 1 Railroad Wrought	14.25 to 14.75
No. 2 Railroad Wrought	13.50 to 14.00
Shafting	16.50 to 17.50
No. 1 Dealers' Forge	13.00 to 14.00
No. 1 Busheling and Wrought Pipe	11.50 to 12.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.00 to 11.00
Cast Borings	6.50 to 7.50
Mixed Borings, &c	7.50 to 8.50
No. 1 Boilers, cut	.... to 13.00
Heavy Cast Scrap	14.00 to 14.50
Stove Plate and Light Cast Scrap	10.00 to 10.50
Railroad Malleable	14.50 to 15.00
Agricultural Malleable	13.50 to 14.00

Metals.—The buying of Copper is on a consumptive basis, which is improving slightly. Prices are inclined to sag. Casting is quoted at 12¾c. to 12⅞c. for carloads, and Lake at 13c. to 13⅛c. Spelter is scarce and firm at 5.50c. to 5.55c. in carloads for spot shipment. Sheet Zinc is unchanged at 6¾c. Tin is in better demand, small lots selling at 30c. The output of Lead is said to be well sold ahead, and prices continue at 4.05c. in 50-ton lots, carloads 2½c higher. The tone of Old Metals is weak and prices somewhat lower, as follows: Heavy Cut Copper is 11¼c.; Red Brass, 10½c.; Copper Bottoms, 10¼c.; Lead Pipe, 3.70c., and Zinc at 4.65c., spot.

Coke.—There is increasing easiness in Coke. While many sellers are holding to former quotations, what is said to be strictly Connellsville 72-hour product is offered on contract at $3, at ovens, and spot Foundry Coke is offered at $2.50, at ovens. West Virginia Furnace Coke is selling at $2, at ovens, and the demand shows improvement. There is comparatively little Coke on track, but consumers can nevertheless pick up about all the fuel they require, some of it at special prices. The tendency of the market is said to be upward for Furnace Coke.

Philadelphia.

FORREST BUILDING, August 11, 1903.

For the first time in several months there appears to be a disposition to buy Iron. It is true that extremely low figures have been accepted for good sized lots, but it establishes the fact that there is a market at a price, and that stocks in consumers' yards need replenishment. This, of course, is a good thing, and encourages the belief that we shall soon know where we are at. It will not do to assume that because Mill Irons have sold at $15.50, delivered, and No. 2 X Foundry at $16.50 to $16.75, delivered, these are bottom prices. They may be, and they probably are, but before coming to any decision in the matter, it will be well to wait and see what follows. The smaller class of buyers may have to pay a little more, in fact $17 to $17.50 is usually quoted on 50 and 100 ton lots, and before these figures are abrogated, makers will want to see a little further ahead. Possibly some of the large buyers will also want further light on the situation before they pay the low figures mentioned, so that while there is reason to believe that a point is being reached at which business can be done, it may not be the final resting place. Nevertheless to-day's prices appear to be satisfactory to those who will require metal during September and October; beyond that there is not sufficient data upon which to base very confident opinions. One of the discouraging features is the dullness and inactivity in Finished Materials. As a rule large consumers appear to be almost as busy as ever, yet it is a fact that the finishing mills are doing nothing like the business that they were doing a year ago. These are matters that are difficult to harmonize with favorable conditions, although it is still possible that there may be a sharp recovery inside the next 60 days. Much will depend on the final results as regards crops, and to no small extent upon the doings in Wall street. Summarizing the entire situation, it may be said that there is more business than there was a week ago, but no improvement in prices. Prospects are better as regards volume of business, but uncertain as to prices.

Pig Iron.—During the past two or three days sales have been quite large, compared with any period during the past three or four months. From some points of view large sales are nearly always regarded as indicating better conditions, and to some extent such may be the case at the present time. The business has been done at a sacrifice in prices, however, and to that extent it is not altogether encouraging. Consumers are beginning to need Iron, but sellers are in the same condition, inasmuch as they need orders, so that it is by no means a one sided affair. During the past three or four months there has been a practical suspension of buying, current requirements having been met by deliveries on former purchases. The books at both ends of the line are now pretty well cleared off, consequently new entries must be made. The beginning on first-class business has been on the basis of about $16.75, delivered, for No. 2 X Foundry, and $15.75 for good Mill Irons. Some have paid more money for special Irons, others have paid a trifle less for ordinary grades, but fair average figures would be as above named. If these should prove to be rock bottom prices, the smaller class of orders should be at 25c. to 50c. more money; but it will require time to determine how the market will act, although it is a fair presumption that it will become steady around to-day's quoted rates. The condition of furnaces, which will probably be announced in this issue, will no doubt throw some light on the situation, and have more or less influence in determining the character of the market during the next few weeks. For the present, however, the extreme range of prices would be about as follows for Philadelphia and nearby deliveries:

No. 1 X Foundry	$18.00 to $18.50
No. 2 X Foundry	16.75 to 17.50
No. 2 Plain	16.25 to 16.50
Standard Mill Irons	15.75 to 16.25
Ordinary Mill Irons	15.25 to 15.50
Basic	16.00 to 16.25

Steel.—Inquiries have been numerous, but the amount of business forthcoming has not been in proportion to the apparent desire to buy Steel. One reason is that some of the mills are still receiving Steel on old contracts, and are therefore inclined to clean close up before placing new orders. Prices as last quoted: $28 to $28.50, f.o.b. local mills.

Plates.—Business in this department is not as buoyant as it has been, although the mills still manage to run moderately full. Large orders are conspicuous by their absence, however, and as there are no indications of much improvement, there is some anxiety to get what there is going at current quotations. Prices are maintained, the agreement among manufacturers being strictly adhered to as follows: Base prices up to 100 inches: Tank Steel, both Sheared and Universal, 1.75c. to 1.80c., in large lots; Flange, 1.85c. to 1.90c.; Commercial Fire Box, 1.95c. to 2c.; Locomotive Fire Box, 2.25c. to 2.30c.; small lots, 10c. to 15c. per 100 extra; 100 to 110 inches, 0.05c. extra; 100 to 115 inches, 0.10c. extra; 115 to 120 inches, 0.15c. extra; 120 to 125 inches, 0.25c. extra; 125 to 130 inches, 0.50c. extra; over 130 inches wire, 1c. extra; Plates under ¼ inch on edge, 0.10c. extra; under 3-16 inch on edge to No. 8, 0.15c. extra; No. 9, B. W. G., 0.25c. extra.

Structural Material.—There is no rush of business, but between new orders and old contracts, mills are fairly well employed. Prospects are not specially encouraging, although the agreement in regard to prices on the following basis is well maintained: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.80c. for carload lots, with the usual addition for smaller quantities.

Bars.—There is no improvement to notice in the Bar trade, either Iron or Steel, and prices of the former are very irregular. Since the practical abrogation of the Bar Iron Association, mills have made prices in accordance with their individual judgment, some being willing to accept extremely low figures, while others have made but slight recessions on the ground that they maintained quality and could not compete with inferior Iron. The range for Iron Bars is about 1.55c. to 1.65c. delivered for carload lots, and 1.70c. to 1.75c. for Steel Bars.

Sheets.—There is a good demand for all the various numbers, and mills are hard pushed to make deliveries as promptly as required. Prices are steady and unchanged.

Old Material.—Business is extremely dull and prices no better than they were a week ago, and in some cases they are slightly lower. A fair average would be about as follows for deliveries in buyers' yards:

Old Steel Rails	$18.00 to $18.50
Heavy Steel Scrap	17.75 to 18.25
Low Phosphorus Scrap	26.00 to 27.00
Old Steel Axles	20.00 to 21.00
Old Iron Rails	19.50 to 20.50
Old Iron Axles	21.00 to 22.00
Old Car Wheels	19.00 to 20.00
Choice Scrap, R. R. N. 1 Wrought	17.50 to 18.50
Country Scrap	16.00 to 17.00
Machinery Scrap	15.50 to 16.00
No. 2 Light Scrap	16.00 to 17.00
No. 2 Light (Ordinary)	11.50 to 12.50
Wrought Turnings	13.00 to 14.00
Wrought Turnings, Choice Heavy	14.50 to 15.00
Cast Borings	8.25 to 8.75
Stove Plate	12.00 to 12.50

Cleveland.

CLEVELAND, OHIO, August 11, 1903.

Iron Ore.—The market has gone an unusually long time now without sales, and still none is in prospect. There have been a few inquiries now and then, but nothing has developed. The general trade is beginning to count upon a very considerable reduction in the volume of Ore brought down the lakes this year. The report for July shows that the movement for that month alone was up to the shipment of the same month a year ago, but there is still a shortage for the year to August 1 of about 600,000 tons. Predictions are made in shipping circles now that the movement during August will be materially less than during the same month a year ago, and the prospects for the employment of vessels are not so bright as they were. Rates of carriage do not change, being 80c. from Duluth, 72½c. from Marquette and 60c. from Escanaba.

Pig Iron.—The conditions in the foundry trade are not changed. The buying in this territory is hand to mouth, and promises to continue so for some time. Consumers are still looking for a reduction in prices, and depend, in a very large measure, upon the dissensions in the Southern ranks to break Northern prices. Producers seem to have taken a stand against any further declines, because they say that the price is rapidly approaching the point where the selling price will be identical with the cost of production. Nevertheless, prices are sagging steadily. The consumption in this territory upon orders for immediate delivery is about as heavy as the production, but it is to be remembered in this connection that many of the stacks in the Valleys are out of blast for repairs. Northern Iron is quoted at $17, Valley furnace, for No. 2 Foundry. The Southern furnaces continue to be a strong element in this situation. Furnaces in the Birmingham district are divided, the associated makers holding for $13.50, Birmingham, and the outside furnaces quoting $12. Production in this territory is untrammeled by any Coke shortage, but the shipments from the furnaces are practically as heavy as production, the piling of stocks being at a minimum. Gray Forge is in very light demand. The price ranges about $16.50, in the Valley. There is a call for Malleable, but not heavy, and the market is firm. The price has declined slightly, going to $17.50, in the Valley. Prompt shipment of all Iron is possible. The Bessemer Association announces that no big sales have been made, and that such transactions as have been reported are of small lots, practically for quick shipment. The quotation which would probably rule on any general buying would be $18, in the Valley, at which the last sales are reported. In Basic about the same conditions apply. One furnace company producing Basic announce that they have not had a letter of inquiry for two months, and others say that the demand is very light. The price which would apply on the market now would be about $18, in the Valley. In a few instances orders have been canceled by firms who say that they have overcontracted.

Finished Iron and Steel.—For the first time this year some of the Sheet Steel producers are willing to admit that prices are being very generally cut on choice mill orders. The stock quotations do not seem to have been disturbed. It is evident, however, that the so-called association prices rule only on small orders, where the price is being held up rigidly. A number of the smaller Sheet mills have been forced to suspend operations because of the lack of orders. We continue to quote, with exceptions noted: No. 27 Black Sheets out of stock, 3.05c. as a basis; No. 14, blue annealed, in car lots at the mills, 2.20c.; No. 27, one pass cold rolled in car lots at the mills, 2.75c. as a basis; No. 27 Galvanized Sheets, 4c. out of stock. Bars have been fairly active only. In some instances Steel Bar mills have run short of orders and have suspended. In other instances mills have been closed for the customary repairs. The market does not seem to miss this idle capacity. Despite the frequent rumors to the contrary, prices have not been cut, the quotations holding at 1.60c., Pittsburgh, for Bessemer and 1.70c., Pittsburgh, for Open Hearth. The Bar Iron situation is not so brisk. The mills generally are looking for business, being guided by local conditions in fixing prices. The market is represented by 1.60c. to 1.65c., Cleveland. Plates have been fairly active only, with little new business. A few of the mills have suspended operations for repairs. The smaller mills generally are looking for business at association prices. The price holds at 1.60c., Pittsburgh. In the Structural situation the market is dead. Even the jobbers are complaining of slack business. Prices hold at 1.60c., Pittsburgh, at the mill and 2.15c. out of stock. Very little Billet business has developed in this territory since the reduction of the prices recently. The rush is not as heavy as was expected. The price holds at $27.50 for 4 x 4. In the Steel Rail trade it is now evident that some of the orders which were placed for delivery in this territory during the year will have to be carried over to the coming year. The inquiry for electric line projects is again assuming interesting proportions. No effort is made to change the price from $28, Pittsburgh.

Old Material.—The market is not very active. The mills continue to draw upon their stocks recently collected and have not come into the market for any material. Prices have been experimentally reduced without bringing about any volume of business. The quotations revised are as follows, nominally, all gross tons: Heavy Melting Steel, $18.50; Old Steel Rails, $18.50; Old Iron Rails, $22; Old Car Wheels, $19; Railroad Malleable, $17; Cast Borings, $8.50, all net tons. No. 1 Railroad Wrought, $18; No. 1 Busheling, $14.50; Wrought Turnings, $12; Iron Car Axles, $22.50; No. 1 Cast Scrap, $14.50; Stove Plate, $11.50.

Cincinnati.

FIFTH AND MAIN STS., August 12, 1903.—(*By Telegraph.*)

It may be a stretch of the imagination to say it, but nevertheless there appears to be a better condition in the Pig Iron market—that is, so far as the Foundry grades are concerned, in which the dullness and deadlock has existed. The market is no lower than it was a week ago, and it is barely possible that it is a little stronger. Owing to the fact that most of the cheap Iron—that is, the Iron at $12 or less—has been taken out of the market so far as shipment is concerned, there has been a considerably larger amount of Foundry Iron sold at prices ranging from $12.50 down to possibly $11.75, Birmingham basis, for No. 2 Foundry. Selling agents here acknowledge having sold quite a little Iron for August and September delivery on the basis of $12, Birmingham, and it is pretty well understood that several fair sized lots were let go at 25c. below this level; but these same agents are positive to-day that they have no Iron to sell for a less price than $12.50, Birmingham, for either prompt or forward delivery. It is generally believed by the association furnaces that the "outsiders" are well sold up for the next 60 days. The association furnaces are standing remarkably firm on their basis of $13.50, Birmingham, for No. 2 Foundry. Some little association Iron has been sold at a slight cut on these figures, but not enough to materially affect the general situation. Buyers are in the market for quite an amount of Foundry Iron—that is, there are inquiries aggregating a good many thousand tons in sight, and the general earmarks of these queries point to them being *bona fide* efforts at purchasing. This inquiry is, of course, for the next 60 days. As far as forward shipments are concerned buyers are refusing to trade in any way whatever. Northern Iron is quotably a little lower, and now on just about a parity with the Southern article. Freight rates from the Hanging Rock district, $1.50, and from Birmingham to Ohio River points, $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1	$15.75 to $17.25
Southern Coke, No. 2	15.25 to 16.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 15.75
Southern Coke, No. 1 Soft	15.75 to 17.25
Southern Coke, No. 2 Soft	15.25 to 16.75
Southern Coke, Gray Forge	14.25 to 15.50
Southern Coke, Mottled	14.00 to 15.50
Ohio Silvery, No. 1	20.15 to 21.15
Lake Superior Coke, No. 1	17.15 to 17.65
Lake Superior Coke, No. 2	16.65 to 17.15
Lake Superior Coke, No. 3	16.15 to 16.65
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$26.25 to $26.50
Lake Superior Car Wheel and Malleable	23.50 to 24.00

St. Louis.

CHEMICAL BUILDING, August 12, 1903.—(*By Telegraph.*)

Pig Iron.—Events of a stirring nature have not enlivened the market at this point, and the report for the past week is about of the same general order as of late. There are indications pointing to a revival of trade, as buyers begin to show more interest, and sales agents are therefore taking a more encouraging view of the immediate outlook. The actual execution of orders has been on a scale of little consequence, but the amount of inquiry coming to hand is larger. The Stove interests and other large users of Iron give promise of keeping well up to the old consumption, and a most conservative look at the situation gives the impression that consumers' demands generally, though placed later than usual, will be in generous volume well up to the record of other seasons. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$16.75 to $17.50
Southern, No. 2 Foundry	16.25 to 17.00
Southern, No. 3 Foundry	15.75 to 16.50
Southern, No. 4 Foundry	15.25 to 16.00
No. 1 Soft	16.75 to 17.50
No. 2 Soft	16.25 to 17.00
Gray Forge	15.25 to 16.00
Southern Car Wheel	26.75 to 27.00
Malleable Bessemer	19.25 to 19.75
Ohio Silvery, 8 per cent. Silicon	23.00 to 23.50
Ohio Strong Softeners, No. 1	19.25 to 19.75
Ohio Strong Softeners, No. 2	18.75 to 19.25

Bars.—A fair amount of business has been the rule during the days since our last report, and the quotations named by the jobbers are unchanged. We quote from the mill: Iron Bars, 1.70c. to 1.75c.; Steel Bars, 1.82½c. Jobbers continue to quote 2.15c. to 2.25c.

Rails and Track Supplies.—Activity of a moderate order has been apparent in the market the past week, and the tone is very firm and steady. We quote as follows: Splice Bars, 2.05c. to 2.15c.; Bolts, with Hexagon Nuts, 3.05c. to 3.15c.; Bolts, with Square Nuts, 2.90c. to 3c.; Spikes, 2.15c. to 2.25c.

Angles and Channels.—The same moderate demand continues for Small Angles and Channels, and jobbers' quotations in lots from store remain at 2.25c. to 2.40c.

Pig Lead.—The demand is said to be very moderate at this time, and sellers have made considerable concessions in prices in order to influence sales. Nominally the quotation is 4.05c. for Missouri brands.

Spelter.—It is said that Spelter in large quantity is not on the market at this time for sale, therefore price conditions continue firm, quotable at 4.45c. to 5.50c.

Pittsburgh.

PARK BUILDING, August 12, 1903.—(*By Telegraph.*)

Pig Iron.—The constituent interests of the United States Steel Corporation in this city, consisting of the Carnegie Steel Company, National Steel Company and American Steel Hoop Company, have a committee that looks after purchases of Pig Iron, Scrap and other materials for these interests. This committee met in Pittsburgh Tuesday morning, August 11, but, contrary to reports, made no recomemndations for purchase of Pig Iron for last quarter. Nothing will be done in this matter by the United States Steel Corporation until September, when it is probable that a block of Bessemer Iron from 75,000 to 100,000 tons will be bought for delivery in last quarter. The Valley furnaces are quoting $18 at furnaces for Bessemer Iron, and it is probable that the contract of the Steel Corporation, if placed, will be at this figure. It is true, however, that a number of dealers are offering small lots of Bessemer down to $17.50 or less at furnace, but the amount of such Iron that is available is relatively small. There have been some inquiries recently for Forge Iron, and we note a sale of 1000 tons of Northern Forge to a local puddling and skelp mill at $16, delivered Pittsburgh, the Iron having been sold by a Youngstown interest. This is the lowest price reached for Gray Forge in this market for a very long time. We understand that the Southern Furnace Association is adhering rigidly to the fixed price of $13.50, Birmingham, or $18.35, Pittsburgh, for Southern No. 2 Foundry Iron. The tonnage being placed at this price, however, is very small, as the local agents for Southern furnaces are offering Georgia and Virginia Irons at about $1 a tons less than Southern association furnaces asked. A local interest bought recently 1000 tons of Northern No. 2 Iron at a very low price, delivered Pittsburgh; but there were some special conditions attached to this sale, which account for the low price. Northern brands of No. 2 Foundry Iron are held at about $17.50, Pittsburgh, but on a fair sized tonnage for delivery over the next two or three months possibly a lower price might be made. The output of Pig Iron this month will likely show a large falling off, as compared with July, for the reason that quite a number of furnaces are closed for repairs and other causes.

Steel.—The market on Steel remains somewhat quiet, but there is a fair amount of inquiry. We are advised that prices fixed by the agreement among the Steel mills are being rigidly held and sales of Billets, Sheet and Tin Bars, though not in large lots, are being made right along. We quote: Bessemer Billets, $27; Open Hearth, $28; Bessemer Sheet Bars, long lengths, $28; Cut Bars, $28.50, with $1 advance for Open Hearth, all for Pittsburgh, Wheeling or Valley delivery.

(*By Mail.*)

We can state officially that the report that the Pig Iron Committee of the Bessemer Furnace Association was to hold a meeting in Pittsburgh to-day, Tuesday, for the purpose of fixing a price on a large block of Bessemer Iron to go to the United States Steel Corporation for delivery in last quarter of this year is untrue. The Steel Corporation is not in the market at the present time and no negotiations are on between this interest and the Bessemer Furnace Association. It is a fact that a meeting of the Bessemer Pig Iron Committee was held in Cleveland on Saturday, August 8, but it was for the purpose of taking action on other matters. Among these was the consideration of a notice recently sent out by the railroad to the effect that hereafter a minimum charge of 50 cents a car would be made for weighing Pig Iron and other Materials to furnaces that do not do their own switching and that do not have their own scales. Heretofore the railroads have weighed cars without charge and the furnaces affected by the new rule have entered a vigorous protest and are trying to induce the railroads to withdraw the new order. A meeting of the Pig Iron Committee of the corporation is being held to-day. General conditions in the Iron trade continue extremely quiet and the amount of tonnage that is changing hands is very small indeed. Buyers seem to utterly lack confidence, and when they do come in the market buy only a carload or two of Pig Iron to tide them over actual needs. The furnaces are not pressing their Iron on the market, knowing it would be useless to do so and would only result in still lower prices. The opinion is general that the Steel trade and Wall street have become too closely identified, to the detriment of the former. A great deal of money has been lifted out of legitimate business channels to protect stocks, with the result that collections are harder than for a very long time and some concerns have found it difficult recently to raise money promptly to meet pay rolls. While the situation is far from satisfactory, yet it is pointed out that the general condition of the country is sound, crops promise to be very heavy, and there is no reason why we should not have a good fall business. As stated above, lack of confidence is largely responsible for the present quiet condition of the Iron trade, and until this is in a measure restored, the situation is not likely to show much improvement. It has been stated that the furnaces in the Valleys, comprising the Bessemer Furnace Association, have not more than 100,000 tons of Iron available for shipment through the rest of this year, and if this is true it is a strong argument in favor of a better Pig Iron market later on. It is practically certain that the Steel Corporation will need some Iron for delivery in last three months, and should the Steel Corporation buy 75,000 to 100,000 tons for last quarter delivery it would strengthen the market considerably. On the few inquiries that are going for Bessemer Iron furnaces quote about $18, Valley, but brokers have picked up small lots of Iron which they are offering at $17.50, at furnace, or less. It is claimed that no large tonnage of Iron could be had at the present time under $18, at furnace. Northern brands of No. 2 Foundry Iron are held at about $17.50, and Northern brands of Forge have sold recently at $16, Pittsburgh. In the Billet pool matters are reported to be moving along smoothly, and a fair tonnage of Billets, Sheet and Tin Bars are being sold at the schedule prices. It is a fact, however, that some of the large Steel interests have recently refused to furnish Sheet and Tin Bars to outside mills at the fixed prices. In Finished Iron and Steel there is nothing of interest to note, tonnage being light with concessions being made in prices on some lines, such as Sheets, Iron Bars and Skelp, where immediate delivery is wanted by the customer.

Muck Bar.—There is practically no demand for Muck Bar, and we quote best local makes at $30, delivered. On a firm offer this might be shaded. Eastern Muck Bar is being offered at $29, Pittsburgh, or less.

Steel Rails.—There is very little doing in Steel Rails, either for this or next year delivery. We quote at $28, at mill, for Standard Sections in 500-ton lots and over.

Ferromanganese.—There is very little doing in Ferro, consumers buying only in small lots from month to month. The United States Steel Corporation have been selling Ferro for some time, and very little foreign is coming into this market. English and domestic Ferro is quoted at $50 in 50-ton lots and over, and German about $49, delivered.

Plates.—Tonnage in Plates is only fairly satisfactory, and some of the larger mills will soon be in need of specifications unless demand improves very considerably in the near future. The Steel car shops, which are the largest users of Plates, have fewer contracts for cars on their books than for some time, and are placing very few contracts for material. Sheared Plates are in better demand than Universal, consumption of the latter having been curtailed very much by the labor troubles. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh: Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Iron and Steel Bars.—There is still a deadlock between the International Harvester Company and the Association of Steel Bar Mills, with the result that the tonnage of the former has not yet been placed. This interest insist strongly that on account of being the largest individual consumer of Steel Bars they are entitled to some concession over the regular price, but so far the mills refuse to grant this. The fact that the mills now guarantee prices on undelivered tonnage of Steel Bars is quite a concession to consumers, and is expected to lead to a larger buying movement. There is a fair amount of inquiry for Iron Bars, but competition among the large interests is very keen, with the result that prices are weaker and lower than for some time. On guaranteed makes of Iron Bars we quote 1.60c. to 1.65c., Pittsburgh delivery, the lower price being regarded as minimum. We quote Steel Bars at 1.60c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs., but not less than 1000 lbs., $2 a ton additional is charged, and less than 1000 lbs., $3 additional.

Structural Material.—The American Bridge Company are booking a fair amount of tonnage, but the the Structural trade has been very much curtailed by labor troubles, as well as the uncertainty of the money market. Many projects for large buildings and other structures have gone over until next year, and some of them may not again be revived. The railroads are expected to make very large improvements next year in the way of building new bridges and making other improvements, and this is regarded as a very favorable condition of the market. Some of the local Structural shops are getting very close to the end of their contracts, and with not very much new work in sight. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

Sheets.—There is a fair amount of inquiry for Sheets, but the mills could take care of a good deal more tonnage if they had it. A material improvement in demand for Sheets is expected early in September, but whether this will actually develop remains to be seen. We continue to quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.60c., and No. 28 at 2.70c. It is possible that on a very nice specification and for large tonnage some mills might slightly shade this price. Demand for Galvanized Sheets is only fair and prices are somewhat easy. We quote at 75 and 10 and 2½ to 75 and 10 and 5 per cent. off in carload lots, maker's mill. For small lots from store jobbers charge the usual advances over above prices.

Tin Plate.—Demand for Tin Plate continues fairly active, and the leading interest as well as the outside mills are extremely busy. The greater part of the business being placed is at the official price of the leading interest, which is $3.80 for 100-lb. Coke Plates, f.o.b. Pittsburgh; but in some cases the outside mills are able to get from 5c. to 10c. advance over these prices for prompt delivery.

Rods.—While the Rod market is quiet, prices are fairly firm, and we quote Bessemer Rods at $35 to $35.50; Open Hearth, $36 to $36.50, and Chain Rods, $38, f.o.b. Pittsburgh.

Hoops and Bands.—Tonnage being placed is somewhat light, but prices are fairly firm. We quote: Cotton Ties, 87c. in 10,000-bundle lots or over; 92c. for carloads; Steel Hoops, 1.90c. in 250-ton lots and 2c. for carloads; Bessemer Bands, 1.60c. to 1.70c. for Open Hearth. Extras as per Steel card.

Skelp.—The Skelp market continues quiet, and prices on this product are lower than for a long time. A sale of 250 tons of Grooved Iron Skelp is reported at 1.82½c., Pittsburgh, Sheared Iron Steel Skelp is held at about 1.90c., Pittsburgh.

Pipes and Tubes.—The Pipe market continues to be the strongest department of the whole market, both as regards demand and prices. All the mills have several months' work ahead and on the larger sizes of Pipe are sold up in some cases for the balance of the year. Prices are firm, discounts to consumers in carload lots being as follows:

Merchant Pipe.

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56

Merchant Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 to 13 inches	55½	38

The outside mills rolling Iron Pipe are naming lower discounts than are given above.

Iron and Steel Scrap.—The Scrap market is practically lifeless, consumers refusing to take in Material at any price. In this condition of the market it is useless to make quotations, which are merely nominal.

Coke.—The Coke market continues in very unsatisfactory shape, and some very low prices are being made, both on Furnace and Foundry Coke for prompt shipment and that has to be moved. Strictly Connellsville Furnace Coke has sold recently as low as $2.25 a ton in special cases, but the usual asking price is $2.50 a ton. Seventy-two-hour Foundry Coke is selling at about $3 a ton at oven. The trouble with the Coke trade is that many of the furnaces, as well as some of the foundries, have shut off shipments and this has caused a large amount of Coke to be offered for resale in the open market and at prices that in many cases are fixed by the buyer. Should present conditions continue, output of Coke will have to be curtailed, and we understand that several of the larger plants in the Connellsville and other regions are now running only five days, being idle on Thursdays of each week.

Birmingham.

BIRMINGHAM, ALA., August 10, 1903.

There is a gradually growing change for a betterment in the Iron market, but the contrast between what it is now and what it has been would not under other circumstances excite comment. As it is, all are glad to see the changed condition, or probably it would be more proper to say the changing condition, for it has not reached that stage where certainty takes the place of hope. The orders have increased in number and they are reported of larger volume. But still the volume has not reached an active stage of business. But for the well-known fact that stocks in consumers' hands are at such a low ebb that their replenishment becomes every day a matter of greater necessity the increased buying would cause no comment. But as it is, every indication of desire to take on a lot is evidence of a run down condition of stock and of the necessity for its repletion. And this feeling is increasing as the business increases, of course it has its influence in reviving confidence. The demand has been mainly for the Foundry grades, with a good share of it covering the Soft grades. There has been no grade neglected and no particular grade has been a special favorite in the buying. The movement has just simply been a gradual and moderate increase all along the line, and is regarded in some quarters as the initiative of the buying movement so long overdue. But there is no purchase for long delivery. It is all, so far, for nearby delivery, and nearly all orders are hedged with the proviso "if can, ship promptly," showing that the satisfying of needs has been delayed as long as possible. The orders indicate a distrust in values, and rumors of the acceptance of low prices are persistent.

As to prices there have in some cases been sales at values less than the association scale. It would be strange indeed if such was not the case. But the extent of such sales has been greatly exaggerated, and statements concerning them have been widely disseminated, and every sale below current quotations has been heralded as the market. This does not indicate a healthy condition of the trade. One buyer who was on the market claimed to have secured a round lot of a certain grade at a concession of $1, but all particulars were withheld. The number of sellers with ability to furnish the quantity announced is so limited that one is puzzled as to why they should shade prices so materially to one and uphold them in all other cases. No one could be found but the alleged buyer who had any knowledge of the transaction. There was a small lot of Gray Forge offered on the market as low as $10.50, and it did not go. The parties to whom it was offered simply did not want it.

Iron has been piling up in the yards, as was to be expected. There has not been, so far, any complaint as to scarcity of cars, but we are on the eve of the yearly crop movement and it will probably be only a short time before Iron melters will be face to face with the problem of delayed shipments.

The arrival of Judge Gray is welcomed by the entire community, and all feel that affairs will be settled on the basis of a lasting peace and the yearly contentions as to wage scale cease. The Coal Operators' Association will be represented by counsel, and each company will have their own counsel to assist and to represent their individual interests. No time will be lost by unnecessary delay. The miners will be represented by W. P. Fairly, the national committeeman, who will direct their case, assisted by counsel. Both sides are on the alert and all the faults of each will be laid bare. From one of the prepared lists, showing daily wages earned, some are credited with such sums as $6.51, $6.78, $5.64 and so on down to below $3. The yearly average is set down at $3 per day. Some few worked 25 days in one month, some 23 days, some 15 days, some 13 days and some less. Out of the 365 days in the year, 240, say two-thirds, were spent at mining. The other 120 days were off days. It is impossible to forecast the result. On one thing you can count, and that is the probing will be as thorough as the Judge will permit.

There is being awakened a renewed interest in the Gold part of the district, and T. B. Aldrich, who rarely chases shadows, is a leading spirit in a company that has commenced operations in two mines in Tallapoosa County. The Ore is crushed and treated direct by the cyanide process with results, so far, that encourage the owners in the belief that Gold mining in Alabama can be put on a very profitable basis.

Coal mining is now favorably progressing, there being only a few mines not running. There is a fine shipping demand for Coal, and, taught by past experience, orders will in many cases anticipate the car shortage that is almost sure to come later on.

(By Telegraph.)

BIRMINGHAM, ALA., August 11, 1903.—The Arbitration Committee have been in session since yesterday morning and are just beginning to warm up to their work. The proceedings have been very tame until this afternoon, when a contention arose over what was to be arbitrated. The

operators wanted all the existing differences to be adjudicated, while the miners insisted upon limiting the verdict to affect only their demands. The result was a lively argument, and the reserved decision of the court to be delivered to-morrow. The miners made a strong statement in their presentation of their side, but have failed to substantiate by evidence that conditions here are comparatively the same as they exist at other places. Their side of the case is closed except as to rebuttal evidence. The miners were allowed three days for presentation of their side and the operators five days for reply. Two days then were given to the miners to conclude the case. In the way of evidence submitted, the miners woefully lacked in direct and convincing testimony and have so far been content to deal more in glittering generalities than the solid, cold facts that influence the judicial mind.

The New York Machinery Market.

NEW YORK, August 12, 1903.

There has been no marked change in the market from the last few weeks, and everything is running along at the regular midsummer pace. Scattering orders for medium and small sized tools still continue to come in in volume enough to keep trade braced up to the point of being fairly good. There is, however, a tone to the market which is very encouraging. In certain quarters expectations are running high. If appearances are not deceiving, a very large corporation, who have been building very extensive additions to their works, are about ready to purchase the mechanical equipment, exclusive, of course, of the engines and electrical machinery. As the fall approaches manufacturers are becoming more hopeful of an early resumption of large orders. With the number of new projects coming up every day which will involve the purchase of a larger amount of machinery, and with all signs pointing toward the early consummation of some important deals which have been under way for some time, it is thought that there will be a considerable influx of new business this coming month.

Official announcement is made that Worcester, Mass., is to be made headquarters for the motive power department and machine shops on the Boston & Albany division of the New York Central Railroad Company, that are now located in Springfield. At the latter city the company have under construction a 50-pit round house and large machine shops, the combined cost of which totals up to over $125,000. The mechanical equipment for these shops was requisitioned some time ago, but we understand that the purchases have not yet been made. Contracts for the round house and machine shops have been abrogated and they will be removed to Worcester. This change is indirectly the result of the strike of the railroad machinists on the Boston & Albany division.

From Portland, Maine, come reports indicating requirements in the way of machinery by the Maine Central Railroad Company. It is stated that the management has completed plans for rebuilding their shops at Thompson's Point, which were destroyed by fire about three months ago, and that the work of constructing the buildings will shortly begin. The plant will be modernly equipped throughout and will consist of car shops 100 x 250 feet; machine shop, 100 x 220 feet, and power house, 70 x 100 feet.

We are officially advised that the Delaware & Hudson Railroad Company will equip their proposed new shops at Plattsburgh, N. Y., with second-hand tools from their other shops. A few weeks ago the company issued specifications for about $75,000 worth of machine tools for their shops at Oneonta and Green Island, N. Y., and Carbondale, Pa. The improvements at Plattsburgh will include a machine shop, 48 x 124 feet; blacksmith shop, 34 x 38 feet; oil room, 20 x 22 feet; sand house, 18 x 20 feet, and store house, 30 x 74 feet. The round house is to be enlarged also.

About as important an event as has happened in the machinery trade for some little time has just transpired in the closing of negotiations whereby Benjamin Guggenheim, president of the Loomis-Pettibone Gas Machinery Company, 52-54 William street, New York, and associates have acquired the Holthoff Machinery Company of Cudahy, Wis. The capacity of the Cudahy plant is to be greatly enlarged by the erection of additional buildings and the installation of new machinery, which has not yet been purchased. As the Loomis-Pettibone Company have not yet contracted for the equipment for their proposed new plant, the aggregate amount of machinery required by both companies is very large. The details are printed in another column.

A large amount of equipment will probably be required by the Hoffman Engineering & Contracting Company of Philadelphia, to complete the contract for the Washington terminal improvement, which was recently awarded them in connection with McMullan & McDermott by the Baltimore & Ohio Railroad Company at their bid of over $2,000,000. Under the agreement the Baltimore & Ohio are to construct the conduits and stone viaducts from Montello, on the Washington branch, to the station at Massachusetts avenue. The stone viaduct will have ten tracks from New York avenue to the station, and the contract includes this, as well as freight terminals, round houses, &c., needed by the railroad. The station is to be built under the direction of Architect D. H. Burnham of Chicago, and the Capitol Hill tunnel and Southern connection by the Pennsylvania Railroad, whose part of the project will cost in the neighborhood of $10,000,000. The final plans for the terminal station, which must cost at least $4,000,000, according to the act of Congress, have not yet been approved.

The Elliott-Fisher Company, 296 Broadway, New York, are considering the advisability of establishing a large plant within a radius of 30 or 40 miles of New York, and are ready to receive propositions for a building already erected and adapted to their purpose. It is not known just what machinery will be required, as the plans have not yet sufficiently matured. One scheme is to remove their plants from Cleveland, Ohio, and Harrisburg, Pa., and consolidate them in New York; another is to operate the three independently. Upon the settlement of this matter will depend the amount of new equipment that will be purchased. The Elliott-Fisher Company were recently incorporated with a capital stock of $10,000,000, and have acquired the properties of the Elliot-Hatch Book Typewriter Company, Fisher Book Typewriter Company, American Railway Typewriter Company, American Standard Typewriter Company and the Keystone Company.

Proposals for the construction of a steel twin screw suction dredge for Savannah Harbor, Ga., will be received until September 5 at the office of the United States Engineer, Witherspoon Building, Philadelphia.

Rumsey & Co., Seneca Falls, N. Y., are purchasing the machine tools for the proposed addition to their works, the contract for which has been let. The building will be of brick, 40 x 120 feet, and two stories high. When completed it will be equipped with modern machinery, enabling the company to greatly increase their capacity. The product is brass lift and force pumps, hydraulic rams, garden engines, &c.

A great deal of the machinery in the boiler shop of the Morgan Iron Works, at the foot of East Tenth street, New York, was damaged beyond repair in the fire at their works August 7, and will have to be replaced. There has been a strike on at the works for several weeks, and the fire, which entirely destroyed the boiler shop, is thought to have been the work of an incendiary. The company will rebuild as soon as possible. The loss is placed at $45,000.

Another fire on the same day, August 7, destroyed the entire nut works of Brady & Hauptman, 404-416 East 104th street, New York, entailing a loss of $50,000. Like the other, almost the whole equipment is wrecked, and it will be necessary to purchase a great deal of new machinery. We are informed that the firm will rebuild without delay.

Within the next few weeks the matter of equipment for his New Medford shops will be taken up by Frank B. Gilbreth, 176 Federal street, Boston. We are advised that it has not yet been decided as to the character and amount of machinery that will be required. The plant is to be located on the Medford River, Medford, Mass., where a site of 348,000 square feet and 600 feet of river frontage has been purchased. It is Mr. Gilbreth's intention to transfer his present plant to the new location and erect a number of buildings for the manufacture of contractors' machinery.

Mining machinery to the extent of $80,000 will be required by the Guanajuato River Power Company, who are to work extensive placer mines in the vicinity of Guanajuato, Mexico. On August 19 a meeting of the directors will be held in New York to definitely settle the details of the project, and very soon thereafter it is expected that specifications will be drawn up for the mechanical equipment. No power equipment will be required, as the company already have a large hydraulic plant. E. G. Spilsbury of the E. G. Spilsbury Engineering Company, 45 Broadway, New York, is in charge of the work, and purchases will probably be made through his office.

John T. Maguire, a capitalist of Providence, R. I., has purchased the entire equipment anl patents of the defunct Mossberg & Granville Mfg. Company of that city, for $35,100. Mr. Maguire owns the building in which the plant is installed, and it is his intention to form a new company and continue the business. The only other offer received was from H. C. Curtis of Providence, whose bid was $33,100.

The Buffalo, Rochester & Pittsburgh Railroad Company have let contracts for the complete electric equipment of their shops and round houses at Buffalo Creek, Buffalo, and of the new shops and round house at the junction of the Buffalo and Rochester divisions, near Salamanca, placing same with the General Electric Company. Both plants will be operated with electric power and electrical lighting, and many thousands of dollars will be expended in the original equipment.

M. H. Treadwell & Co., 95 Liberty street, New York, have received an order from the Clairton Steel Company for three cinder cars for the St. Clair furnaces, at Clairton, Pa. They have just completed the installation of a large crane in the Benj. Atha Steel Works, Newark, N. J., and

two in the Central Iron & Steel Works, at Harrisburg, Pa. The company are now manufacturing a full line of foundry supplies, including core chaplets, and will add to their works complete tinning and galvanizing departments.

The Ithaca & Auburn Electric Railway Company have incorporated with a capital stock of $1,000,000, to construct an electric road, 40 miles long, between Ithaca and Auburn, N. Y. The company will be ready to contract for the equipment and construction of the road within the next few weeks. Sherman Collins, Ithaca, is secretary.

The American Locomotive Company have had a good sized machine tool list out for some time, and it was expected that the purchases would be made early this month, but so far the orders have not been placed. The tools are for their plants at Schenectady and Dunkirk, N. Y., at both of which points they have been making extensive improvements.

Representatives of machinery houses are directing their attention to the General Electric Company, who, we understand, have had their representative in the street for the past couple of days looking into the purchase of a large amount of machinery for their Schenectady plant. The company recently placed orders for a considerable amount of equipment for their Lynn, Mass., plant, but these did not nearly meet their requirements. As has been stated in these columns, the company are erecting very large additions to their shops at both Schenectady, N. Y., and Lynn, Mass.

New York.

NEW YORK, August 12, 1903.

Pig Iron.—A somewhat livelier demand is reported, but it is still restricted to the immediate requirements of consumers. There have been sales of moderate lots of Basic Pig, and there is some inquiry for round lots of Low Phosphorous Pig. We quote, at tidewater: No. 2 X Foundry, $16.50 to $17; No. 2 Plain Foundry, $16 to $16.50; Gray Forge, $15.50 to $16; Basic, $16 to $16.50. Tennessee and Alabama brands: $16.75 to $17 for No. 1, $16.25 to $16.75 for No. 2, and $15.75 to $16.25 for No. 3.

Steel Rails.—The demand is restricted to small lots of Rails for trolley roads, and to small parcels for standard roads. Prices remain unchanged at $28 for Standard Rails and at $34 to $37 for Light Rails.

Cast Iron Pipe.—The result of the 7000-ton letting in this city has not yet been made public. Bids were to be opened on Tuesday on a small quantity of Pipe, and special castings in this city, but none were received. The sizes asked for were small, and on these the Eastern foundries are so well sold up that none of them appeared to care about the business. The time is now at hand when the Cast Iron Pipe trade usually tapers off, but the demand for small quantities is keeping up wonderfully well this year. Quotations on carload lots are continued at $34 per gross ton, at tidewater, and $33 for 12-inch upward, but these prices are shaded in some cases.

Finished Iron and Steel.—No contracts of importance are reported either in bridge or building work. A great deal of tonnage is in sight, however, and the bridge builders are looking forward to a great deal of business to develop during the month. The New York Central will this week place a contract for 10,000 tons of the material needed on their terminal improvements in this city, and the remaining 20,000 tons required will be placed under contract some time next month. Business in the Structural line is checked partly by the decline in securities and partly by the belief among consumers that prices are tending downward and advantages will be gained by postponing purchases for some little time. The Plate trade is quiet, inquiries at present being very light. The local shipyards are evidently not taking many new vessel orders at present, and the protracted labor troubles are restricting the demand for Plates from general manufacturing establishments. Prices are maintained on the Pittsburgh basis. The Bar Iron trade is light, with reports of quite low prices. We quote at tide water as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Refined Bars are 1.65c. to 1.80c.; Soft Steel Bars, 1.70c. to 1.80c.

Old Material.—Profound dullness rules this branch of the trade. Some dealers report that they are not even receiving an offer from consumers. Quotations continue nominal. The approximate figures are as follows per gross ton, New York and vicinity:

Old Iron Rails	$19.00 to $19.50
Old Steel Rails, long lengths	18.00 to 18.50
Old Steel Rails, short lengths	15.50 to 16.00
Relaying Rails, heavy sections	22.50 to 23.00
Old Car Wheels	17.00 to 18.00
Old Iron Axles	22.50 to 23.00
Old Steel Car Axles	20.00 to 21.00
Heavy Melting Scrap	15.50 to 16.00
No. 1 Railroad Wrought Iron	16.50 to 17.00
Iron Track Scrap	15.50 to 16.00
Wrought Pipe	11.50 to 12.00
Ordinary Light Iron	8.50 to 9.00
Cast Borings	6.00 to 7.00
Wrought Turnings	12.00 to 12.50
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate	10.00 to 10.50

Pig Iron Production Sharply Reduced.

Stocks Increased.

Our monthly blast furnace reports show a heavily reduced capacity through the blowing out or banking of many furnaces, and an almost general lessening of the output during July, with the furnaces which have been blowing steadily.

During July no less than 20 coke and anthracite blast furnaces were banked or blown out, and only five furnaces started during the month.

Among those which were stopped on the first of the month were: Durham in the Lehigh Valley, Tidewater in the Schuylkill Valley, Fannie and Sharpsville in the Shenango Valley, Marshall in Western Pennsylvania, Vesta in the Lower Susquehanna, and Ashland in Kentucky, one Columbus in Ohio, one Wellston in the Hanging Rock, two Hubbard in the Mahoning Valley, Ella, one North Birmingham, Talladega, Vanderbilt and two Woodward in Alabama, and Citico and Helen in Tennessee, and Allegheny in Virginia.

As an offset there were blown in Secaucus in New Jersey, Buena Vista in Virginia, one Ohio Steel in the Mahoning Valley, one Sheffield and one Woodstock in Alabama.

Although July was a month of 31 days, as compared with 30 days for June, the production fell off in nearly every district, that being notably the case in Alabama, for various reasons, and in the Central West.

Our production statistics are based upon the returns of all the coke and anthracite furnaces in the country, with the exception of two small furnaces in Eastern Pennsylvania, the Lehigh with an estimated monthly product of 1850 tons, and the Leesport with 1450 tons. In the West the Sarah in the Hanging Rock region, with a monthly product of 3500 tons, sends no returns. The possible error is within 1000 tons for the aggregate returns. At times reports are not received in time from other companies, but with records running over many months, experience has proven the estimates to be remarkably close. We shall in the future indicate the aggregate tonnage estimated.

Monthly Pig Iron Production.

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York	43,941	42,069	47,330	49,762	48,293
New Jersey	14,834	19,998	20,908	18,383	19,533
Schuylkill	48,476	45,234	47,973	46,550	41,143
Lehigh	60,804	61,286	67,409	62,972	60,861
Susq. and Lebanon	46,052	53,782	62,294	60,905	57,920
Pittsburgh	372,125	362,747	415,518	420,946	402,779
Shenango	117,533	127,985	132,208	118,743	108,234
West. Penn.	105,488	97,294	92,016	94,742	91,570
Md., Va. and Ky.	92,798	93,039	92,106	82,448	80,214
Wheeling	64,044	69,743	73,657	85,531	86,916
Cent. and No. Ohio	108,587	110,017	122,442	127,668	105,127
Mahoning V.	137,744	129,988	114,361	110,347	98,541
Hanging Rock and Hocking Valley	37,256	36,929	37,923	29,537	28,186
Ill., Wis., Minn., Mo. and Col.	170,977	199,685	219,666	207,023	201,386
Alabama	126,068	117,372	125,863	117,761	81,439
Tennessee, No. Carolina and Georgia	43,743	41,263	41,940	39,910	38,198
	1,590,470	1,608,431	1,713,614	1,673,228	*1,550,340
Charcoal pig.	35,728	37,611	42,352	43,678	44,482
Totals	1,626.208	1,646,042	1,755,966	1,716,906	1,594,822

* Product estimated 18,800 tons.

This shows a reduction of output in July, as contrasted with June, of over 122,000 tons, in spite of the fact that the latter month had 31 days. The May product, for 31 days, was 161,000 tons greater than that of July.

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem and Colorado companies show a total product of 987,855 tons for July, as compared with 1,021,839 tons in June, 1,037,325 tons in May and 966,850 tons in April.

Production of Spiegeleisen.—The production of spiegeleisen and ferromanganese was 14,933 tons in July, as compared with 16,309 tons in June, 17,600 tons in May and 17,555 tons in April.

There has been a very sharp reduction in the capacity of the furnaces in operation, as is shown by the following table of the weekly capacity of these furnaces in blast on August 1:

	Total capacity per week. Gross tons.	Coke capacity per week.	Charcoal capacity per week.
August 1, 1903	361,903	352,554	9,349
July 1	395,042	384,825	10,217
June 1	398,139	388,178	9,961
May 1	381,697	373,496	8,201
April 1	376,576	368,215	8,361
March 1	354,733	347,424	7,309
February 1	343,111	335,339	7,772
January 1	353,800	346,073	7,727
December 1, 1902	343,817	336,617	7,200
November 1	337,559	330,110	7,449
October 1	345,048	337,837	7,211
September 1	335,189	328,243	6,946
August 1	336,465	328,745	7,720
July 1	310,950	303,793	7,157
June 1	344,748	337,492	7,256
May 1	352,064	337,627	6,437
April 1	337,424	331,140	6,284
March 1	323,028	316,039	6,989
February 1	332,045	325,440	6,605
January 1	298,460	291,992	6,468
December 1, 1901	324,761	317,358	7,403
November 1	320,824	313,775	7,049
October 1	307,982	300,538	7,444
September 1	299,861	293,256	6,605
August 1	303,847	297,269	6,578
July 1	310,850	303,793	7,157
June 1	314,505	306,391	7,514
May 1	301,125	293,915	7,210

Coke and Anthracite Furnaces in Blast.

	August 1.			July 1.	
Location of furnaces.	Number of stacks.	Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York	17	9	9,550	10	11,278
New Jersey	7	6	4,425	5	4,294
Spiegel	3	1	166	1	150
Pennsylvania:					
Lehigh Valley	27	23	13,523	24	14,119
Spiegel	1	1	99	1	116
Schuylkill Valley	13	10	9,085	11	10,862
Low. Susquehanna	10	7	7,431	8	8,333
Lebanon Valley	12	7	5,565	7	5,878
Pittsburgh District	36	34	89,300	35	95,399
Spiegel	3	3	1,637	2	1,850
Shenango Valley	19	15	23,974	17	27,707
Western Penn.	18	16	20,677	17	22,106
Maryland	5	4	7,366	4	6,989
Wheeling District	12	10	19,626	10	19,957
Ohio:					
Mahoning Valley	15	12	24,883	13	26,388
Cent. and North	16	13	23,738	14	27,789
Hocking Valley	3	2	1,000	2	1,000
Hanging Rock	12	8	6,051	9	5,888
Illinois	19	15	33,031	16	32,124
Spiegel	2	2	1,375	1	934
Minnesota	1	1	1,247	1	1,318
Wisconsin	5	5	4,321	5	4,987
Missouri	1	1	792	1	841
Colorado	4	4	4,706	4	5,370
Spiegel	1	0	0	1	350
The South:					
Virginia	23	17	9,328	17	10,124
Kentucky	8	3	1,400	4	1,735
Alabama	41	24	20,140	28	26,826
Tennessee	16	13	7,065	15	8,171
Georgia	1	1	774	1	542
North Carolina	1	1	279	1	400
Totals	352	268	352,554	285	384,825

Charcoal Furnaces in Blast.

	August 1.			July 1.	
Location of furnaces.	Number of stacks.	Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New England	7	2	185	2	169
New York	3	2	754	2	770
Pennsylvania	5	3	114	3	121
Maryland	1	0	0	0	0
Virginia	4	1	54	2	83
Ohio	8	4	200	4	168
Kentucky	3	0	0	0	0
Tennessee	2	1	70	1	62
Georgia	4	3	890	3	1,002
Alabama	5	4	1,182	5	1,403
Michigan, Missouri and Wisconsin	14	12	5,646	12	6,007
Texas	4	1	254	2	432
Totals	60	33	9,349	36	10,217

Stocks.

The position of furnace stocks sold and unsold, as reported to us, was as below on August 1, as compared with the preceding months, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	March 1.	April 1.	May 1.	June 1.	July 1.	Aug. 1.
Anthracite and Coke	144,394	156,732	147,312	182,665	234,425	311,174
Charcoal	14,959	14,025	15,430	20,738	22,585	31,289
Totals	159,353	170,757	162,742	203,403	257,010	342,463

Metal Market.

NEW YORK, August 12, 1903.

Pig Tin.—In a speculative way, the market has been somewhat more active, but judging from deliveries to consumers the current requirements are not heavy. The premium on spot is falling off, and it looks as though it would disappear altogether, because to-day two steamers with 900 tons each arrived, and another steamer with 900 tons is due on Monday next. Spot Tin is quoted at the close at 28.30c. to 28.70c., while August is 28.25c. to 28.30c., and September 27.90c. to 28c. At the Metal Exchange there were sold to-day 100 tons of August at 28.25c. and 10 tons of September at 27.95c. London cables to-day £128 5s. for spot and £123 17s. 6d. for three months.

Copper.—The market has continued exceedingly quiet, with Lake selling at 13c. to 13⅛c., Electrolytic at 13c. and Casting at 12⅝c. to 12¾c. London cables the market strong at £58 5s. for spot, £56 5s. for futures and £61 for best selected.

Lead.—The market is quiet at 4.12½c. to 4.15c. for spot Lead. London cabling £11 1s. 3d.

Spelter.—The market has gained in strength and closes at 5⅞c. to 6¼c. for spot and August.

Antimony.—Cookson's is easier at 7.25c. to 7.50c., while Hallett's continues at 6.50c., and other brands at 6.25c.

Nickel—Is quoted at 40c. to 45c. for large quantities, and 50c. to 60c. in small lots.

Quicksilver.—The market continues at $47.50 for flasks of 76½ lbs. London cables £8 10s.

Tin Plate.—The market is quiet. The American Tin Plate Company quote $3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.90, New York. English cables are 11 shillings 6 pence for Plates in Wales.

The Boston & Albany Machinists.—The machinists employed at the shops of the Boston & Albany division of the New York Central Railroad went on strike last Saturday, after demanding ten hours' pay for a nine-hour day. The chief trouble is in the company's shops at Springfield, Mass., where 150 men are on strike, comprising practically the entire force, and as the men are chiefly employed on repair work this department of the system is badly crippled. As a result of the strike the officers of the company make the announcement that the Springfield shops will be moved to Worcester, because, as they put it, there has been constant trouble with the machinists employed at Springfield, and they believe that conditions in Worcester will be much better. The officials of the road also state that the contracts for a large roundhouse and for the machine shop now in process of erection at Springfield will be canceled. The shops of the Boston & Albany road at Alston, Mass., near Boston, and at Rensselaer, N. Y., are also affected by the strike. The officers of the company offered to submit the question to arbitration, but the men declined to do so. The wages of the men were advanced the first of the year, varying from 5 to 10 per cent.

The strike at the Buffalo Union Furnace Company's plant continues in force. It was announced the latter part of last week that the strikers had accepted the company's proposition and that the strike was settled, but the company refused to take back some of the strikers, and in consequence the majority of the men declined to return and the works remain shut down.

Trade Publications.

Automatic and Expansion Engines.—A handsomely printed and well arranged catalogue of 16 pages and cover has just been issued by the Ironton Engine Company of Ironton, Ohio, builders of Allfree automatic and expansion engines. In addition to the usual descriptions and illustrations the booklet contains several pages of well tabulated matter showing the indicated horse-power ratings of the engines under various conditions at one-quarter cut off; elaborate dimensions of the various sizes of the standard single cylinder, center crank, expansion gear Allfree engine and standard single cylinder, side crank, expansion gear Allfree engines.

Cap Screws.—The Cleveland Cap Screw Company of Cleveland, Ohio, are sending to the trade a folder illustrating the cap screw heads as ordinarily made, in comparison with those made according to the United States standard. These diagrams are very interesting, showing a considerably larger cap screw head on the various sizes of bolts made according to the United States standard than those of the same size as ordinarily made. It is claimed that the United States standard head, as recommended by the Franklin Institute, is more desirable, has a larger bearing surface under the head, affords better distribution of pressure, permits the use of cored holes, saves drilling and dispenses with washers. The company note the fact that all screws and bolts produced by them are made to conform to the United States standard specifications as to the United States screw heads. The forms of threads may, however, be obtained as desired, either the United States standard or sharp V being obtainable.

Electroplaters' Supplies.—A catalogue of the products of E. Reed Burns, manufacturer of electroplaters' supplies and specialties in polishing materials, Brooklyn, N. Y., has just been received. The booklet is issued in pamphlet form, standard size, 6 x 9 inches, of 64 pages and cover, and is replete with all sorts of valuable data concerning the electroplating industry.

"Smokeless Combustion" is the title given by the Duluth Stoker Company of Duluth, Minn., to an attractively arranged pamphlet describing their stokers. A very novel effect is obtained in printing a silhouette cut in black on a gilt background showing numerous smokeless chimneys. This is placed on the front cover, which is printed on a dark brown rough finish dekel edge stock.

Hydraulic Wheel Presses.—E. R. Caldwell & Co., Bradford, Pa., are sending to the trade an eight-page leaflet illustrating and describing their hydraulic wheel press. This press is now made in eight standard sizes, ranging from 30 inches between parallel bars, of 100 tons capacity, to 100 inches between parallel bars and 300 tons capacity. The three features of merit claimed for this press are strength, simplicity in construction and convenience in operation.

Industrial Railways.—In a neat little pamphlet the C. W. Hunt Company, 45 Broadway, New York, show miniature half-tone engravings of their various systems of industrial railways, special cars, standard cars, electric locomotives and track materials. The work is concise and to the point, and in a very small amount of space covers the subject very thoroughly. The printing, which is done on coated wood cut paper, is very creditable. This company have also issued a rather unique and striking leaflet illustrating and describing their coal tubs and contractors' tubs. A series of excellent illustrations show the coal tubs in operation on various classes of work.

Furniture Springs.—A highly artistic production received from the Staples & Hanford Company, Newburg, N. Y., is entitled "The Perfection of Spring Work." The pamphlet is gotten up in most elaborate style, having an embossed cover, and being printed on highly finished paper in three colors, presents a striking appearance. The various forms of spring work produced by the company are illustrated and described in a rather unique but excellent manner of execution. Sectional views of couches, chairs and other pieces of furniture, showing the application of the company's products, furnish practical demonstrations of numerous improved methods.

Grinding and Polishing Machinery.—A complete catalogue of the emery grinding machinery, corundum wheels, polishers' supplies, machinery, &c., sold by L. Best, 45 Vesey street, New York City, selling agent for the Sterling and Safety wire web emery and corundum wheels, has just been issued. The catalogue covers the subject very thoroughly, showing illustrations of the numerous machines and supplies, and in addition to the descriptions pertaining to the same, tabulations of telegraph codes, &c., are given to aid in the matter of prompt delivery. The pamphlet is of 80 pages and cover, standard size, 6 x 9 inches.

Fuel Oil Engines.—A pamphlet issued by the Fuel All Power Company, 60 Wall street, New York, offers to engine builders throughout the United States a guarantee and the right to manufacture and sell Ostergren fuel oil engines on a royalty basis. The Ostergren internal combustion engine is of the two-cycle type, in which an impulse is given to the piston at each forward movement thereof. The engine is said to be particularly adapted to the use of heavy oils, such as crude oil, kerosene, gasoline or wood alcohol. It contains a novel form of circular baffle plate constructed as a part of the piston, and the arrangement of admission and exit ports whereby at the lower end of the stroke clean air is admitted into the cylinder through the piston to the interior of the circular baffle plate, thereby driving the dead products around the baffle plate and out of the cylinder. The engine is arranged to compress in its upward stroke clean air only and fuel is admitted only at the final upward position of the piston. At the moment it is desired to admit fuel to the cylinder to obtain the combustible mixture to be used as motive fluid the balance port is closed by movement of a small plunger operated by a cam from the main shaft; at the same time the pressure behind the valve is slightly raised, whereby the fuel is admitted. After a working stroke the plunger is moved downward and acts then as a suction pump to draw fuel into the valve chamber.

Precision Lathes.—The Pratt & Whitney Company have just issued one of their standard 6 x 9 booklets on their bench lathes, 10-inch tool makers' lathe, 13-inch engine lathe and 14-inch gibbed carriage engine lathe. The book contains 67 pages and is fully illustrated with excellent half-tone plates. The first 37 pages of the book are taken up with a description of the 7 x 32 inch bench lathe. This machine is described in detail and illustrations are given of more than 30 of the various attachments which may be furnished with the lathe, giving an adequate idea of the great diversity of work for which this machine is adapted. The 10-inch tool makers' lathe is also carefully described, and illustrations are given showing the application of the collets and split step chucks to the spindle. There are two views of the 14-inch lathe, one showing the standard lathe, the other the lathe with pan bed. A number of important attachments for this lathe are illustrated and described. These include the relieving attachment for relieving straight, taper and spiral taps and milling cutters, draw-back collets, step chucks and closers and expanding arbors.

Ventilating and Exhaust Fans.—To this subject and that of light power transmission machinery and specialties, B. F. Perkins & Son of Holyoke, Mass., devote a very handsome catalogue containing 160 pages, standard size, 6 x 9 inches, and a tastefully illumined cover. The book is printed on an excellent grade of paper in two colors throughout and is very artistically arranged. The typographical effects are very good and several hundred fine half-tone engravings are used. The mechanical execution deserves special credit, but it is only in keeping with the careful editing and high class arrangement of the entire book.

Drill Chuck.—The Butler Chuck Company of Greenfield, Mass., have recently brought out a No. 2 chuck carrying drill from ⅜ to 1 inch in size. The company assume to have their No. 1 size so far perfected, and their tests for strength were so satisfactory that they feel confident the chuck will hold anything if properly applied. The sample chuck which the company are now testing at their factory will hold a drill to stall any machine they have carrying a 2¼-inch belt, back geared.

Nickel Anodes.—By the new process adopted by the Zucker & Levett & Loeb Company of New York they make nickel anodes almost entirely free from carbon and of a fine, close grain, which causes them all to wear evenly in the solution. No crucibles being used in melting the nickel, no carbon can be absorbed. Nearly all of the carbon which might be asborbed from other sources is oxidized by air being forced through it at great pressure while the metal is in a molten state. As the process is a continuous one, an even temperature is maintained, so that the anodes are exactly alike.

Automatic Gas Burner.—A recent bulletin by the Holtzer-Cabot Electric Company of Boston describes their automatic gas burner, which has been greatly improved so as to increase the range of effective current and provide a positive action of the armature. A distinctive feature of the burner is the manner in which the valve is opened. This is accomplished by a series of impulses, at each of which a spark is created. If the battery is not of sufficient strength to ignite the gas no movement of the valve can take place, thus insuring safety against escaping gas.

Pneumatic Tampers.—In a pamphlet the Philadelphia Pneumatic Tool Company describes the Keller pneumatic tampers for use on copper converters and steel converters. The use of these tools has shown a saving from 70 to 92 per cent. and the work is rammed harder and more uniformly than is possible by any other method. The same company have prepared a brochure on the care and use of pneumatic tools, which contains much practical information.

Circulars have been received from the Buhl Malleable Company of Detroit, Mich., describing their carriers for pulp wood, sawdust, tan bark, lumber, &c.

Hopkinson Machine Works Company, Springfield, Mass, issue a circular describing a vise for holding work in upright drills which is made especially for that purpose. The manufacturers state that it is convenient to handle, quickly and easily adjusted, and soon pays for itself in saving of time and drills. The jaws of the vise are 5 inches wide, 2 inches deep and open 6½ inches. The stop pins are hardened and cannot fall out, and by lifting and turning slightly will stay up, permitting the jaw and follower to be easily moved to the desired position and the pins dropped into place. The holes in the base for stop pins are ¾ inch apart and the jaw has 1 inch travel with screw, and can be quickly adjusted to the work. A dropped forge wrench fitting binding nut and screw is furnished with each vise. The company also make a smaller vise light enough to handle on a sensitive drill or speed lathe and strong enough to hold a piece of work without slipping.

The Wagner-Palmros Mfg. Company, Fairmont, W. Va., are sending out folders illustrating their mine car wheels, which are made according to special design for strength and durability. They also make mine cars.

HARDWARE.

MANUFACTURERS enjoy special opportunities for forming organizations of a practical character. So many matters come up in the conduct of manufacturing establishments which can be treated advantageously through an organization of those engaged in the same line that it is an easy matter to form an association from which tangible benefit will be secured. A manufacturers' association does not necessarily deal with prices. It may be organized to handle questions connected with administration, as, for instance, the arrangement of wages schedules, or as an outgrowth of recent developments in this field it may be designed primarily for defense against tyrannical regulations of labor unions. Organizations have frequently been effected solely for the purpose of looking after the rights of members under patents, when the business in which they are engaged is of a character which involves processes controlled to a greater or less extent by patents. An organization can usually safeguard the interests of an individual member better than he can do so independently. Associations taking cognizance of such matters often look into other legal questions, such as the rights of corporations in States other than those in which they have been incorporated, and keep their members informed with regard to their privileges or disabilities.

The purely commercial associations may be classified as restrictive and regulative. The restrictive organizations are those whose aim is to control a trade closely and to govern prices and possibly output. The regulative organizations acknowledge their inability to control prices and output, but endeavor by all means in their power to secure such harmony of interests as may conduce to the establishment and maintenance of remunerative prices. Restrictive organizations are usually short lived. They may for a time be very successful in establishing prices which will be highly profitable. Such perfect control of a trade may apparently be secured that those interested feel that they can look forward to the enjoyment of large profits for a long series of years. But ultimately, unless intrenched by the possession of patents of an essential and unassailable character, they come to grief, either through the growth of outside competition or the greed of some of their own number who desire a greater share of a good thing. The regulative associations are the more reasonable of these commercial organizations, and are more likely to attain greater longevity. Buyers are, of course, antagonistic to both, as they prefer an open market in which competition for their patronage is absolutely unrestricted. But while their antipathy to restrictive associations is to be commended rather than criticised, they will often find that a regulative association is of advantage and should really be encouraged. It is of special advantage in a line comprising a great variety of products or of sizes. If all manufacturers in such a line should proceed on a completely independent basis, getting out price-lists having no relation to one another and classifying their products according to their own individual views, the task of a buyer in making comparisons of prices would be very much greater than with uniform lists and with variations merely in discounts. The establishment of systematic methods of this character is in itself an achievement with which many associations must be credited, even though their attempts to maintain prices may be altogether discredited. The creation and maintenance of some standard of comparison of value can only be accomplished through an association. But from the largest manufacturer to the smallest merchant, all are interested in the establishment of such standards.

It is somewhat remarkable that, whatever the motive may be which brings manufacturers together in an association, they usually endeavor to secure something of an educational value from one another at their periodical meetings. They are anxious to learn more about their business than they can ascertain within the walls of their own establishment, and generally they find even their sharpest competitors quite willing to impart the results of their experience. So much indirect benefit is derived in this way that many a manufacturers' association prolongs its existence largely because of the belief among the members that the educational features more than repay them for the time taken and expense incurred in attending the meetings.

Condition of Trade.

The volume of business is possibly under that of last week, but a hopeful feeling characterizes the trade. The dullness in local circles is expected shortly to give way to a much better condition as active operations are resumed in the building trades. A great deal of work is in an unfinished state, and, even if new building projects are slow to develop, much business is to be expected from the completion of work which has thus been suspended. The conditions in the West are regarded as very favorable for a good fall trade in that section. Agriculturists are in excellent financial circumstances as a result of several good crop years, and even though the crops of this year may not come up to the average their purchasing power will not be seriously impaired. The most glowing reports come from the South. That section of the country is enjoying exceptional prosperity, partly through the very high price of cotton and partly by reason of large crops of other products. The Southwest is being particularly favored with good crops, and a heavy demand for manufacturing products is expected from that direction. While buyers are naturally influenced by the great fall in securities and the lowering of prices on raw materials, and are therefore expected to be conservative in anticipating their wants, nevertheless considerable confidence is felt that they will be fairly free in placing orders for such seasonable goods as their experience for several years has taught them may run short as the hight of the demand develops. No general weakening in prices is observed in Hardware, the changes during the past week having been slight. In fact, in a few instances advances have been made instead of declines.

Chicago.

(By Telegraph.)

One of the departments of Hardware concerning the activity of which there can be no doubt is Tin Plates. Jobbers in this city make repeated endeavors to buy or borrow from each other, that they may fill current orders, but the question is usually unsuccessful. Stocks are broken everywhere. There are orders which were placed with mills as long ago as last March, which remain unfilled. Under the conditions, the market is naturally strong. This state of the market denotes large consumption, for the mills are understood to be running full time. Another department that has recently shown increasing activity consists of Stove Boards and the various lines that enter into Stove and Furnace equipments. Salesmen who have been devoting special attention to these have been meeting with gratifying success. They are seasonable at this time, but owing to the sad disarrangement of the Stove trade last fall a brisk demand for this line is anticipated this year. Concerning tools there is a difference, those used by the build-

ing trades are lapsing into dullness of demand, but Shop Tools are maintaining excellent popularity. Generally speaking, there is a reasonably good demand for Shelf Hardware, which is so large that the Hardware interests have no occasion for dissatisfaction, but the orders that are received are usually quite moderate, and represent only the immediate wants of the trade, as a rule. This moderate buying, however, is not a new development, for it has typified the trade for several weeks past. There is a slowness of the heavier lines, due to the tendency of material to decline, or to the expectation of buyers that they may decline. But for the lighter and more finished articles of Hardware, there are no notable evidences of price variations. There is a steady consumption of Hardware in seasonable volume, and with retailers' stocks reputed to be light this consumptive requirement is appreciable at the warehouses of jobbers as quickly as it appears.

St. Louis.

(*By Telegraph.*)

The promise for fall business continues very encouraging, and the actual amount of trade coming to the jobbers is in large volume. Jobbers report a steady growth in the mail order business. This is the season of the year when many buyers in the different lines come to this market to talk over the situation and make their selection for new stocks, and it is noticed that a liberal sprinkling of visitors of this character are in the city. Local builders are still contending with labor troubles, and this, of course, means a curtailment of the demand for certain lines of Hardware. A liberal amount of inquiry is continually coming to hand, and it is thought now that there is a more encouraging outlook for a betterment in financial conditions orders will be made for more liberal stocks.

NOTES ON PRICES.

Wire Nails.—There is a slight improvement in demand, particularly from the Southern section of the country, while the movement from the mills generally is considered good for the season. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.05
Retailers, less than carload lots	2.15

New York.—The local market has undergone no marked change during the week. Demand continues as active as is anticipated at this season and under strike conditions. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—There is a vacation appearance to the Nail trade just now, orders being brought under the influences of midsummer. However, there are no indications of price variation, the market being maintained with perhaps unusual fidelity, considering the slackened wants. A better call for Nails is anticipated with the advent of the fall months. Prices are well sustained, as follows: $2.15 to $2.20 in carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

Pittsburgh.—New business in Wire Nails is only fair, buyers still confining their purchases to small lots. The mills are able to ship out promptly and a better demand is expected when fall trade opens. Prices are firm and are as follows: $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—Current demand is moderate, and some mills are employed in filling contract orders. Quotations are as follows: $2.15, base, in carloads, and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The market is firm, with a steady but restricted demand. Quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

Chicago, by Telegraph.—Inquiry is light and only small quantities are moving to the country. Prices are unchanged on the basis of $2.30 in carload lots and $2.35 in less than carload lots for Steel, Chicago; Iron Nails are held at $2.45 to $2.50 per keg from store.

Pittsburgh.—Demand continues fair and mills are shipping out orders very promptly. We quote: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads: Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—There are reports of a more active demand, although this is moderate. Mills are making preparations to supply the active trade which is anticipated by accumulating stocks. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—There are some indications of reviving interest in Barb Wire, but the trade is not above the usual volume for this season. The indications are that farmers are busy with their crops. The market is firm. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots, and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

Pittsburgh.—New business is light, but the mills are accumulating large stocks in expectation of a heavy demand when fall trade opens. Prices are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—Current demand continues active in the West, while the requirements of the East are at present for small lots. A gain in business from all sections is expected in the near future. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—The feature of the market for Plain Wire is a continuation of a better demand than is found in other branches of the Wire trade, but the buying may be less insistent than a week or two ago. Prices are firm at at previous quotations. Prices for Wire remain unchanged, as follows: Nos. 6 to 9, $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Pittsburgh.—New orders are mostly for small lots and old contracts have been pretty well cleaned up. The mills expect a heavy fall business. Prices remain firm, and are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Cordage.—Activity in the Rope market keeps up well for the season, but is lighter than earlier in the year. There is considerable competition among manufacturers on the cheaper grades of Sisal Rope. Quotations, on the basis of 7-16 inch and larger, range with different manufacturers as follows: Sisal, according to

quality, 8¼ to 10 cents; Manila, 11½ to 12 cents per pound. These prices are shaded ¼ cent per pound in large quantities.

Shot.—An advance in the price of Shot is announced under date of the 7th inst. Present quotations are as follows, terms net 30 days, or 2 per cent. discount for cash in 10 days, the usual abatement being given in ton lots:

	25 lb. bag.
Drop Shot, up to B	$1.50
Drop Shot, B and larger	1.75
Buck Shot	1.75
Chilled Shot	1.75
Dust Shot	2.00

Glass.—A report from Pittsburgh this week states that the American Window Glass Company will only operate about one-fourth of their former capacity, and that the other three-fourths of their capacity will be equipped with the new blowing machines. This report lacks official confirmation. There is no doubt, however, that the American Company will equip additional factories with the machine, if it has proved a success, upon which point there are conflicting views. The fact that the American Company were willing to sign a wage scale in advance of that of the last fire is pretty good evidence that they are not in a position to dominate the market at present, but are willing to divide business with other manufacturers. The Jobbers' Association's local quotations are as follows: In small lots, 90 and 5 per cent. discount for the first three brackets and 90 and 15 per cent. discount for all sizes above, either single or double strength.

Paints and Colors.—*Leads.*—The local demand for White Lead in Oil shows improvement from nearby points, as labor troubles are being adjusted and work which has been interrupted is being resumed. An early fall demand is anticipated. Quotations for standard brands are as follows: In lots of 500 pounds and over, 6¾ cents; in lots of less than 500 pounds, 7¼ cents per pound. Other brands are sold for ¼ to ½ cent per pound below these prices.

Oils.—*Linseed Oil.*—The market remains quiet, demand being confined to jobbing lots. The undertone is steady, owing to crushers showing no disposition to make contracts for forward delivery on the basis of present prices for current orders. In fact, there is a tendency toward higher prices on their part, as it is claimed that there is no profit in manufacturing Oil at present quotations. Large buyers are still waiting for lower prices before placing contracts. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town brands of Raw are quoted, according to quantity, at 35 to 37 cents per gallon.

Spirits Turpentine.—The market is firmer with advancing tendencies, owing to a stronger feeling at Savannah and a limited local supply. Quotations, according to quantity, are as follows: Oil barrels, 52½ to 53 cents; machine made barrels, 53 to 53½ cents per gallon.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM PALACE HARDWARE STORE, Erie, Pa., who have just put in a complete new system for filing catalogues, price-lists and quotations. They carry a line of Hardware, Fittings, Mill Supplies, Stoves, Mechanics' and Molders' Tools, Agricultural Implements, Buggies and House Furnishing Goods.

FROM CODE & STEIGERWALT, who have succeeded T. W. Hauser at Ames, Iowa, in the Shelf Hardware, Stove, Tinware and Plumbing and Heating business.

FROM FRANK E. SMITH, Meridian, Miss., who is intending to open up in the General Hardware line in September. Mr. Smith has been with J. N. Melton and Melton Hardware Company for the past 18 years.

FROM E. L. TERRY HARDWARE COMPANY, Warrior, Ala., wholesale and retail dealers in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils, Sporting Goods, &c.

MORLEY BROS.

MORLEY BROS., the well-known jobbing house of Saginaw, Mich., have recently completed 40 years in the Hardware business at that point. When the Messrs. Morley came to Saginaw in 1863 they formed a copartnership with the late Anton Schmidt, the firm style being Schmidt & Morley. The name was changed to Morley Bros. in 1865, which style has since continued. As the city grew and the surrounding territory developed the business of Morley Bros. expanded, until now their trade extends over many States. In 1881 they erected the fine establishment on North Washington avenue, four stories high and extending in the rear to Tilden street, covering nearly three-quarters of a square. The company are also extensive manufacturers of Harness and Saddlery, having a factory at 113-117 South Tilden street. The Morley Bros. Saddlery Company, a branch institution, in Chicago, also operate a large establishment, employing about 200 hands. The original Morley brothers, George W. Morley, aged 72, and Edward W. Morley, aged 64, are still actively identified with the corporation as president and vice-president, respectively. They have always taken a prominent part in efforts to advance the interests and welfare of their adopted city. The other officers of the company are Harry Barnes, secretary, and Ralph C. Morley, treasurer.

TRADE ITEMS.

GEORGE B. MAIN of the Allerton-Clarke Company, New York, has just returned from a business trip through the South, West and Middle States, begun last February. According to his observation and information, the crops are in very good condition, especially in the South and Southwest. He says considerable building is being done, and that the prospects for an excellent fall business are fine.

A SPECIAL ISSUE of the Albuquerque (N. M.) *Journal-Democrat*, July 28, contains a sketch of the history and growth of this progressive city, and also references to its business houses. Among the houses of whom mention is made are the Whitney Company, wholesale and retail dealers in Hardware, House Furnishing Goods, Builders' Supplies, &c., and Albuquerque Hardware Company, retail merchants.

WHITE LILY WASHER COMPANY, Davenport, Iowa, tendered their employees a picnic on August 2 at Linwood, a steamer and barge being chartered for the occasion. Two baseball games and a number of athletic contests, for prizes donated by the company, were the principal features of the day. Full justice was also done to a sumptuous luncheon. The outing was a success in every particular.

A SENSATIONAL ARTICLE recently appeared in a New England daily paper, alleging that a strike was threatened by certain employees of the L. S. Starrett Company, Athol, Mass. The Central Labor Union of that town has, however, issued a circular denying the truth of the article and stating that the relations between the L. S. Starrett Company and their employees are amicable and satisfactory, as they always have been.

SAMUEL M. NICHOLSON, president of the Nicholson File Company, Providence, R. I., sailed for Europe Tuesday, August 11.

M. C. HANTON, 103 Chambers street, New York, who has been made the exclusive agent for the Northern Hardware Specialty Company, 1401 North Broadway, St. Louis, Mo., manufacturers of Rubber Faced Floor, Counter, Window and Bar Cleaners, controls the territory within the limits of New York and New Jersey and all of the New England States.

Michigan Retail Hardware Dealers' Association.

THE ninth annual convention of the Michigan Retail Hardware Dealers' Association assembled at the Hotel Cadillac, Detroit, Mich., at 11 a.m., Wednesday, August 12, President T. Frank Ireland of Belding in the chair. The roll call was postponed until the afternoon session.

President Ireland announced the appointment of committees on Credentials, Constitution and By-Laws, Question Box, Resolutions and Nominations, as follows:

CREDENTIALS: F. A. Turner, Caro; C. F. Lewis, Pentwater; Adrian Dewindt, Grand Rapids.

CONSTITUTION AND BY-LAWS: E. S. Roe, Buchanan; F. Brockett, Battle Creek; J. B. Sperry, Port Huron.

QUESTION BOX: M. A. Benson, Saranac; A. Harshaw, Delray; E. B. Standart, Holland.

NOMINATIONS: Henry C. Weber, Detroit; A. G. Schoeneberg, Saginaw; W. A. Hassack, Mendon.

RESOLUTIONS: Samuel W. Winchester, Jackson; J. H. Temmink, Greenville; F. Marshall, Ovid.

Charles Harris of Detroit was appointed sergeant-at-arms.

The minutes of the preceding meeting were read and approved. Among the communications presented was one from the jobbers and manufacturers of Detroit inviting the members to be their guests for a boat ride on Thursday evening. The communication was signed by the Acme White Lead & Color Works, Art Stove Company, Berry Bros., Boydell Bros., Buhl Sons Company, Detroit Stove Company, Detroit White Lead Works, H. D. Edwards & Co., Fletcher Hardware Company, Freeman, Delamater & Co., Michigan Stove Company, Peninsular Stove Company, Pittsburgh Plate Glass Company, Wm. Reid, Standart Bros. After payment of dues and receiving of new members the convention adjourned until 2 p.m.

WEDNESDAY AFTERNOON.

Upon the reassembling of the convention at 2 o'clock the convention was welcomed to Detroit by Lawrence Cotton, representing Mayor Wm. C. Maybury. After report of the Committee on Credentials the president delivered his annual address as follows:

President's Address.

It is with pleasure that I greet you in your ninth annual convention, and although we are here on serious business and have a large amount of hard work to do, still we will get much pleasure out of this meeting, and our convention week is one of the happiest of all the year.

It seems but a short time since a few of us met in this same building and organized this Hardware Association. It was July 9, 1895. We little dreamed then what we should accomplish by this time, nor did we realize the amount of work before us.

WHAT HAVE WE DONE?

We have, with the aid of other associations, passed a garnishee law that amounts to something. We have kept the Parcels Post bill hung up in committee. We have multiplied the difficulties of the mail order houses, and succeeded in getting a number of manufacturers and jobbers to refuse to sell them. We have asked the railroads to stop distributing mail order house catalogues, and they did so willingly. We have met each year, rubbed up against each other, learned something, and broadened our horizon. We have aggressive associations in 18 States, and we are recognized as a power; but the more we do the more we find that must be done.

Your president and secretary attended the National meeting in Chicago in March, an account of which you read in the "National Bulletin." The three days were full of work and enthusiasm. Michigan was given a place upon the Executive Committee, and while your officers do not wish to boast, we think that the work you are doing in Michigan shows up well when compared with the other States. In May the National officers met the National Jobbers in Philadelphia. At this meeting we had the retailer, the jobber and the manufacturer working together for the common good on questions that must be met and solved, and we believe a good start was made, and in time you will begin to realize the benefit of that meeting.

Your secretary will give you the number of new members we have secured the past year, and while we have much to be thankful for, still we want more members, more work done, and more results. We point with pride to the local associations of Saginaw, Grand Rapids, Detroit and others. What they have accomplished locally can be done on a larger scale in the State and over the entire nation.

RECOMMENDATIONS.

I place before you the following recommendations, and ask their adoption:

That we have our State meeting in February. That we divide the State into districts or counties for canvassing and getting new members. That we organize more local associations. That we have executive sessions each

T. FRANK IRELAND.

day of our meeting, and that the business transacted be kept secret. That we do not publish the names of our members. In this warfare for trade do not enlighten the enemy.

I recommend further that you attend your State and, when possible, the National meetings. Get more enthusiasm; enter complaints; take and read trade papers. All should get acquainted. While I do not believe in the boycott, I do recommend that you buy of your friends and fellow workers instead of from those who sell ammunition to your trade enemies.

We cannot get along without the jobber any more than he can get along without us, and while there are those who are willing and anxious to help us, there are others who want our trade and also furnish goods to the mail order houses. Which jobber will get your trade? Ask the National secretary.

We have before us a long and interesting programme, which awaits our attention. I ask for your prompt attendance at all of our sessions. Gentlemen, I thank you for your kind attention, and now the meeting is yours.

Secretary's Report.

The report of A. J. Scott, secretary, Marine City, was then presented, as follows:

In the many years that I have been a member of this association I have attended the annual conventions and

listened to the reports of the officers with the feeling that the association had shown excellent judgment in selecting these men to occupy the important offices; men for whom the work of a president, secretary or treasurer was as natural as selling Nails or fixing the price marks on a stock of Hardware. It never occurred to me that possibly some of these gentlemen had felt just as much like a fish out of water when serving the association in an official capacity as I did when the organization honored me a year ago by electing me secretary.

I looked upon the work, as it were, with fear and trembling, but thanks to the loyal assistance of many valuable suggestions which were forthcoming from the other officers of the association as soon as the new year was entered upon, the work of the organization has progressed favorably, and I cannot help but feel at the present time that during the past year the moral strength of the association has been materially added to, and its prestige greater at the present time than ever before. This condition, I think, has, to a certain extent, been brought about by our affiliation with the National Association.

A. J. SCOTT.

THE NUMERICAL STRENGTH OF THE ORGANIZATION

has not been increased as rapidly as might be desired, but it is noticeable that there is an increased interest in the work of the organization among a large number of our members, and the courtesy which has been extended to us in nearly all cases where we have had complaints to make against manufacturers and jobbers is strong evidence that the latter more than ever before have noted the advance of the organization idea among retailers and have a wholesome respect for the force which lies in such a movement.

COMPLAINTS.

During the year seven complaints have been entered by members of the association, only one of which was not settled to the entire satisfaction of the complaining parties. In all other cases the ground was carefully gone over and an effort was displayed on the part of the various jobbers and manufacturers interested to convince your officers that to do anything antagonistic to the interests of the retailers was entirely contrary to their policy. Could I but read you some of the correspondence that came to the secretary in these matters I am sure that you would leave this hall with pride in the strength that your association has attained, but I feel that it would be a discrimination to announce the names of any firms who have written us in this way, as there are a great many other jobbers and manufacturers who have not been called upon to write us on such matters, and yet who are just as loyal to the organization as the ones from whom we have heard.

An excerpt from one of these letters might be interesting, and I will read you a portion of it, leaving out the name of the jobber and the city from which the complaint was made. It is as follows: "In answer to your favor of the 21st, would say that upon investigating, we find that the goods mentioned in your letter were sent as you stated, and we frankly acknowledge that we should not have done so. We wish to say, however, that we have adjusted the matter with the member of your association who reported the same by giving him what he deemed the proper credit or commission. We at all times endeavor to protect the retail trade, but in spite of the utmost diligence, transactions of this kind will sometimes occur and it will be our invariable rule in such cases to make said allowance." There are other letters in the file of the association which are just as positive in their expression of regard for the rights of the retailer, and I am satisfied that no firm can now with impunity ignore the rights of the association.

AN ABUSE CORRECTED.

One important matter which has come before the association within the past year is that of railway freight agents distributing catalogues among consumers, in the interest of the large mail order houses. In January of this year two of our members advised us that freight agents in their respective cities were engaged in this business, and had placed catalogues in the hands of many of their customers. Letters were written to the general freight traffic managers of both the Michigan Central and the Père Marquette railroads, and replies were immediately received from both, stating that the roads would not countenance any such actions on the part of their employees, and inclosed with their letters copies of circulars which were being sent out forbidding this practice. When we consider the hundreds of catalogues which were prevented from being distributed in this way, and will not be distributed in any other manner on account of the expense, we can realize the value of this restraining order on the part of the railroads.

PARCELS POST LEGISLATION.

Last year some resolutions were passed at our convention discouraging the passing of any parcels post legislation at Washington. The resolutions were forwarded to the Congressmen from Michigan, but this one action is not all that is necessary to offset the strong influence which is to be brought to bear at the coming session of Congress by the catalogue houses to secure some legislation of this kind. The National Association, as no doubt Mr. Bogardus will advise you at our meeting this afternoon, has taken up this matter in an active manner, and is enlisting the support of the members of the association in all the States affiliated with it. Petitions are being circulated in all the territory covered by the national body, and the members of your association were recently written on this question, urging them to send in petitions to their Congressmen signed by as many business men as possible, and I wish at this time to urge upon our members the necessity for aggressive action in this matter. You are all familiar with the old adage about a stitch in time, and this is an instance in which we have every reason to believe that some strong opposition to such legislation at the present time will be much more effective than twice the effort on our part after the advocates of the law have secured a foothold.

One of the most important matters in the welfare of an organization of this kind is that of

SECURING NEW MEMBERS.

We must be constantly adding to our members and spreading the work of the organization in towns where we have no members or otherwise the association would be taking a backward step. At the last convention the secretary reported 122 members paid up to date and 79 members one year in arrears for dues. Among this number there are ten that either have gone out of business or are dead, 15 were two or more years in arrears, and after repeated letters and requests for replies, were dropped from the list, while 14 members advised us that they had previously written to the secretary of the association, resigning their membership. Before the name of any member has been dropped from the list every possible effort

has been made to secure his consent to remain in the organization, but I feel that we are doing ourselves no good or increasing the prestige of the association by allowing members' names to remain on the list when they do not pay their dues. With the above deduction which I have enumerated it will be seen that practically 162 members at the last convention had sufficient interest in the organization to pay their dues.

During the past year we have interested 38 new members in the organization, all of whom I am satisfied may be depended upon to work in the interest of the association as faithfully as the older members. It might be interesting to record how they were secured, as from it we can draw a very profitable conclusion. Nine new members joined at the last annual convention. Your president, Mr. Ireland, through his personal solicitation, added ten names to the list, a paid solicitor whom we had out for the past three months secured 16 new members, two of the members of the organization secured one new application each, while only one application was received by mail in spite of the fact that three times during the year a letter was sent out to every Hardwareman in the State, explaining the work of the organization, inclosing application blanks and urgently soliciting replies from them. These figures should be sufficient to convince us that personal solicitation is the solution of the membership question.

It is a hard matter to secure a good man and pay him a reasonable compensation for his work, as the material upon which he works is to a certain extent limited, and his expenses for traveling of course must be paid by him. The solicitor, Mr. Wilbut, who has been working in the interests of the association for the past three months, has been delayed in his work through sickness and other causes; otherwise, if we may judge from the results which he secured when on the road, your secretary's report would show a great many more new members received. Personally, I feel that your next secretary may gather some valuable pointers from the secretary's experience this year, and will rely upon a paid solicitor to increase the membership in the association.

We have now 126 members paid to date, 74 paid up to the first of the present year, many of whom, I believe, from past experience, will pay their dues at this meeting, making a total of an even 200 members who may be considered in good standing at this time. In addition to these, there are seven names on our membership list who have not paid their dues for the past two years, but whose names have not been dropped in the hope that they might still be interested and pay their dues in full to date.

During the past year two meetings of the Executive Committee have been held, the first one being on Friday, August 15, 1903, on board the steamer "Sappho," upon the occasion of the excursion given by the Detroit jobbers. The principal work accomplished at that meeting was to empower the secretary to take what steps he thought best to secure new members.

Another meeting was held at the Hotel Cadillac, Detroit, on May 7 of this year, at which every member but one was present. Two complaints were taken up by the committee at that time and instructions were given to the secretary regarding the course to be pursued in securing a settlement. Other matters, such as the appointment of a Programme Committee for this convention, were taken up and disposed of at that time.

On March 16 your president and secretary went to Chicago to attend the annual meeting of the National Association of Retail Hardware Dealers, at which representatives were present from 15 different States, and I cannot refrain from reproducing at this time a small section of the report of President Cormick at that meeting, which may be considered supplementary to that part of my report in which I referred to the growth of prestige which has followed the work of organization among retail merchants. The section of the report referred to is as follows:

"As a result of the work during the past year, I would call your attention to the following extract from the report of T. James Fernley, secretary-treasurer of the National Hardware Association, at New Orleans, November 19, 1902:

During the spring months it was our pleasure to visit upon invitation quite a number of the retail Hardware dealers' associations. We were convinced of three things—first, that these organizations were rapidly growing, not only in numbers but in usefulness. Second, that they were being conducted by men of ability—men who were the peers of those found in the wholesale Hardware business. Third—and I assure you it was most gratifying—we found that these organized retailers were looking with great favor on the National Hardware Association.

Many important matters of vital interest to the welfare of the organizations in all States were discussed at the meeting, since which time many letters have been received from secretaries of other States, and your secretary has been enabled to keep in close touch with what is being done in other parts of the country.

The question of organizing a mutual insurance company under the auspices of the National Association was discussed at length, and I think that President Bogardus will give you the details of what has been accomplished in this line.

In closing this report I cannot refrain from giving public acknowledgement of my thanks to President Ireland and the other officers for the valuable advice and suggestions which they have offered from time to time, and I have also many members to thank for friendly letters which I have received. I will long remember the past year as one in which I made the personal acquaintance of many of our members whom I had not previously met, and whose friendly acquaintance I regard as one of my most valuable assets at the present time.

I hope that the meeting which we are about to hold will be prolific of much good to the delegates who attend, and that we may enter upon the coming year wth renewed strength and confidence in our association and a determination to work harder than we have ever done before to increase our strength.

Competition and Margins.

An interesting paper, entitled "Competition and Margins" was read by Fred. J. Cook of Fowlerville, which brought forth an interesting discussion. Mr. Cook's paper was as follows:

It is a great pleasure for me to be with you again this year, to see the faces I have been accustomed to for the past nine years, and to enjoy the social as well as the business end of our annual convention. It seems to me that there could not be a more royal, social and business lot of men gathered together than I always meet at our conventions. I am also pleased to see so many new members this year, and trust we may all work together to largely increase our membership each and every year.

This is the first time I have been honored with a place upon your programme, and I will say to you with all candor it is not my long suit to write papers. I would rather sell a good bill of Hardware at a good margin; however, as the committee was kind enough to honor me with an invitation, I decided I would be generous enough to appreciate it, accept and do my best with the subject assigned to me, which is of interest and importance to us all.

It is an old saying that competition is the life of trade, and I believe that good competition is, and is what we all want to work together to maintain. I have been connected with the Hardware trade over 20 years, but only 14 years as the proprietor of a Hardware store. During my experience I have seen great changes in the competition and margins of the Hardware business, and some of you who have been longer in the business have realized no doubt even greater changes than I.

and therefore the competition were confined to Hardware stores. We have seen the conditions change from year to year, until to-day, instead of being limited to the Hardware trade, as we naturally believe it should, our competition is practically unlimited.

To-day we have the department stores, bazaar stores and in many instances even the dry goods stores in most of the good villages as well as cities in our State, in fact in all States of our Union, to compete with more or less in every line of Hardware, besides the catalogue houses and in many instances manufacturers, who market more or less of their product, either openly or slyly, to the con-

sumer, and this has all the time changed our basis for margins. We cannot conduct our business on the old method, because we haven't the old time conditions. We must deal with conditions as they exist, not as we might prefer to have them—meet all of the various obstacles and competition and keep the margins on the right side of the ledger.

Every village as well as city needs a Hardware store, and we are going to continue to supply that demand, and it is our duty to do so to as great an extent as possible. From the fact that there is no business that requires a larger investment of capital, brains and labor in taking care of the endless details than ours, I believe that it is right that we should use every honorable means to build and hold the Hardware business upon a paying basis, to enable us to meet our obligations, support our families and lay by a little for the rainy days and old age, which are sure to come.

This is the age of organization—laborers, farmers, manufacturers, merchants, all; it matters not whether we do or do not believe in organizations, we must organize our lines of business or we will not in many ways be able to keep any kind of pace with the times. In a way it is a case of survival of the fittest. We must therefore keep ourselves fitted for competition and margins in every possible way.

OUR STATE AND NATIONAL HARDWARE ASSOCIATIONS

are of great benefit to us in many ways. It is not necessary for me to mention the benefits to our line of business our organization has brought about. You know them as well as I, but we should have ten times as many members as we have in Michigan, and we should not be satisfied until every retail Hardware dealer in Michigan is an interested member of our association. I feel that those who are not members will soon realize that they are not doing right by permitting a minority of the Hardware dealers of the State to work for their good as well as our own and not lend a helping hand. What we want to work for, in my opinion, from this time on is a solid membership in each village and city where we now have one or more members. I would rather have a solid membership in 50 towns than a broken membership in 500. Then they could form a local organization, get together occasionally on a social as well as a business basis, and would soon learn to treat their competitor as their friend instead of the old fogy, erroneous way of looking upon a competitor as an enemy. This, in my opinion, would go a long way in solving our problem of competition and margins.

We must meet the competition to our trade and lead it wherever possible with an eye constantly upon the margin. People demand that we keep a tin shop in connection with our store. We do this, I think, to-day more for their benefit than our own. They want tinners in their town to do their work, but go to the bazaar store and buy their Tinware—cheap stuff, to be sure, but supplies the want, and the Hardware store loses the sale and margin. We should, therefore, get good prices for all job work, as the department and bazaar stores cannot supply this want.

THE STOVE DEPARTMENT

of the Hardware business in my opinion does not pay a cent of profit to the average dealer, and it certainly should. A stock of Stoves runs into money, and large expense is incurred in handling them, and how often sales are made at 10 per cent. margin when the actual expense is more. In my opinion a Stove should never be sold at less than 25 per cent. margin, and the custom of throwing in this and that article should be stopped. Bazaar, department and dry goods stores do not usually handle Stoves because of the investment and labor involved. They want us to handle all the undesirable lines and they pirate upon our Shelf and Case Goods, where the investment and labor are less and profits more. Do you not think we should stand with our neighbor Hardwareman in maintaining satisfactory prices on all these goods which we only keep, thus enabling us to meet their price cutting on Shelf and other goods? How often we pay a man $10 per week to black and set up Stoves, and our charge for doing so is so small that the dry goods clerk, getting $5 per week, feels he cannot afford to soil his hands in blacking a Stove when he can get the Hardwareman to do it for perhaps the cost of the blacking material. I speak of this to illustrate the many things we do at a less margin than we can afford to, and no one to blame but ourselves, competition not forcing us to do so—simply one Hardwareman cutting the other's throat, and the chickens always come home to roost.

SASH, DOORS, GLASS, ETC.

It has been customary for the Hardware trade to sell Nails, Doors, Sash, Glass, and all the large items entering into the construction of a building at cost and in some extreme cases at less than cost in order to get a customer in line to sell him the furnishings. I don't think this ever paid, because the goods sold at cost run into so much money, even though the trimmings were sold at a handsome profit, it cuts the average percentage down to about the cost of doing business, not leaving a net profit. With the competition as it is to-day it surely is a losing game to handle the building trade on such a basis. If we sell the various staples in our line at a satisfactory profit we can meet or beat the outside competition on the Trimmings, Paints, Oils and merchandise needed in our line.

I do not think it pays Hardware stores to handle Binders, Mowers and large Implements, as the extra expense incurred is usually more than the profit realized.

THE CATALOGUE HOUSES

do not worry me particularly. I advertise to furnish the same class of goods for the same price with transportation added as the catalogue houses offer. I feel that we are justified in keeping our line out of their hands as much as possible and prevent their obtaining any unjust advantage over us. One thing we should do and that is to get away from the unreasonable and unjust but established practice of extended credit. If we made a limit of 60 days' credit upon open book accounts many of our customers would not have so much money to mail away to catalogue houses. We could meet our bills promptly, save more cash discounts, evade some losses, rest better nights, all of which would help our margins materially.

It pays to keep a lookout for desirable specialties in our line and push them hard, reaping a profit before undesirable competition gets hold of them.

We must go forward energetically looking for business and securing it wherever we can at a safe margin, never becoming discouraged, being polite to everybody, employing our time, never telling business lies, being prompt as possible in everything, bearing our troubles patiently, maintaining our integrity as a sacred thing, not appearing to be something more than we are and carefully examining into every detail of our business, standing by our organization and each other and doing all in our power to bring ourselves and our business up to as high a plane as possible.

W. P. Bogardus, president of the National Retail Hardware Dealers' Association, was then introduced by President Ireland, and addressed the convention instructively and entertainingly.

The following papers will be read at to-morrow (Thursday) morning's session:

Local Organization.

BY C. M. ALDEN, GRAND RAPIDS.

First. I want to thank the Committee on Programme for placing my name among those of the speakers on this occasion, for I consider it an honor to address a body of such distinguished business men as are the members of this association.

Second. I think we should congratulate ourselves upon the place of meeting—there is always a warm spot in my heart for old Detroit, the home of my boyhood—Queen of History, Romance and Beauty. Her history as far back as 1700 reads like a novel, full of the bloody struggles of the Indians, French and English, until she rests in the bosom of Uncle Sam. May she shine on, as she ever has, the brightest star of the North.

I suppose the only struggle she has now to contend with is our friend, "Weber and the Gang;" however, considering the fine treatment we have had and the

pleasant prospects ahead. I believe the struggle is a happy affair.

I want to say right here, we must not be like Old Saunders, and expect too many needles for our egg—that was in the times when a treat followed a good trade. Saunders brought an egg to the grocery and traded it for a darning needle. The merchant noticed him waiting, and asked if there was anything he could do for him. "Ain't you goin' to treat?" said Saunders. "What for?" said the merchant. "Why, on that trade." "What, on that little trade?" "Wall, a trade's a trade." "All right, what will you take?" "Egg-nog." So the merchant turned out a little of the "stuff," and broke Saunders' egg in it—when lo! out came two yolks. "Gee whiz!" exclaimed Saunders, "if that egg didn't have two yolks. Say, don't you think you owe me another needle?"

I was invited to talk about local organization. If it had been left to my choice I should have decided to talk about two minutes; so if I talk longer, and say nothing, don't be disappointed.

The most miserable and unhappy man is he who is living in solitude. Isolated and alone, with no one but

C. M. ALDEN.

self in solitary confinement is a state which narrows the individual and often leads to insanity.

Association, the opposite, leads to companionship, co-operation and organization, which broadens and brightens the man and established brotherhood.

THE FEVER TO ORGANIZE

is upon us. It is a disease the doctor of industry has never met with before, consequently has no medicine in his bag to counteract its ravages. It is here, and the only thing to do is to have the fever—organize—and wait until the doctor can prescribe the right medicine, and don't you fear but he will finally touch the right spot.

Organization within itself is not the disease; but the fever to over do, and do everything and everybody is the disease. Organization, as Webster defines it, is the "act of arranging in a systematic way for use and action." Without organization, force and energy would be without value. Take it in whatever capacity you wish, and force and energy must be harnessed, controlled, organized, to be of any use.

The earthquake, volcano, tornado and flood are without a doubt systematically arranged by the Creator for an eternal purpose, but because we are powerless to control these forces they cause disaster to us. The vast armies of the world are arranged into divisions, brigades, regiments and companies, and all have their required officers, and being thoroughly organized is their hope of victory, considering numbers.

Our nation stand to-day without a peer, because we are organized right. The sun, moon and stars are arranged by the Supreme Being into the planetary system, and the animal and vegetable species into their kingdoms, for "organization is the first law of heaven," and must be of earth before the social question will be solved. Therefore, if the Higher Power does not attempt to operate without systematic arrangement, I ask, Why do the Hardwaremen of Michigan attempt it?

The question may be asked by some, Do we need it locally? I believe I voice the sentiment of 66 2-3, 25, three 10s, 7½ and 5 per cent. of the trade of Michigan when I say most emphatically, we do.

You say a man would be a fool to organize in your town. It is because you don't understand the situation and condition existing about you. This reminds me of the man whose wagon wheel was set, and going to the nearest house asked the occupant, who was a Swede, if he had a monkey wrench. The Swede looked at him with a dazed expression, and said: "My brother, Nelson, 5 miles south, has a sheep ranch; Ole Johnson, over west, has a cattle ranch. I tink a man a big fool to have a monkey ranch in dis country."

LOCAL ORGANIZATION IS NEEDED

for the following reasons:

1. Because business methods are changing rapidly and we soon get behind the times, narrowed down to same old rut that we have followed for years. The problems of to-day are larger by far than those of yesterday, and details demand our attention as never before. We must meet unprincipled men who undermine our prices by unfair methods. Organization brings out different ideas how to meet these problems. "Two heads are better than one, if one is a sheep's head," so the sheep said. This is an old but true saying, as is demonstrated by the excellent work done in convention all along the line of industry, commerce and art.

2. From a social standpoint the unorganized all hate each other. How many of you ever visited your competitor's store before you organized? You labored under the idea that you had a divine right to your locality and that your competitor was an intruder, and the sooner you "busted him" the better. Organization would bring you together, rub you up against each other and make you both better acquainted with your jobber, and not only make you all friendly, but, dare I say, brotherly. Yes, and why not brotherly? This feature alone is worth more than all the paltry dollars you put in for dues and assessments. It would establish perfect confidence in each other.

3. No two stores have the same prices, which is the occasion for 75, 25, four 10s and 5 per cent. of the fights. Smith asks 65 cents for a Shovel. The customer says, "I think I can get it at Brown's for 60 cents." Smith holds his price, and customer goes to Brown and is asked the same. Customer bluffs about going back to Smith, and Brown says, "Well, take it for 60 cents." Smith hears about it, and you know the rest. There is a fight on Shovels, till they are all gone, and no money made. Organization would regulate the prices on as many articles as you desire and on a living profit. You would also be enabled to meet the department store and catalogue house price without feeling that you were cutting your own town prices. It would also bring into line the plumbers and dealers in Agricultural Implements. All could agree to one price on all goods they handle that are mentioned on our price sheets.

4. The ledger contains the names of several "dead beats." There are people who live on the merchant as much as they can, they run accounts at the grocery, meat market, &c., and often move, beating their landlord and merchants, and locate in another section of the town, and "do them" there. Organization would head off this practice. Jones would be compelled to pay Brown before Smith would trust him. The plumbers in certain localities have this system so perfected that it is impossible to even get a piece of work done on a cash basis unless you settle your old account with the complaining plumber.

5. The need of education. It is a fact that the average man is not up to the standard of his calling. I don't say that this applies to the Hardwareman any more than to others, but I do think that the retail Hard-

wareman needs it very much. No mercantile business has so many advantages for intellectual achievements as the Hardware. We are brought into contact with every other line of industry by supplying their needs, hence it is to our advantage, first, to have a thorough knowledge of our own business, especially pertaining to our business methods, and the nature and quality of our goods, and, second, to know something about our customer's occupation, that we may keep in touch with his demands and meet them with satisfaction and intelligence. Organizations can be made a means to this end by talks on topics of interest, bearing on any information desired and thus elevate ourselves to a higher standard of intelligence.

6. To cope with other organizations. As I said before, the fever to organize is on, and there are organizations galore—every line of industry is organizing, and with a large majority of them you are indirectly interested. You must meet them with the intelligence and dignity characteristic of the Hardware merchant.

CATALOGUE HOUSES.

Of the many organizations in existence there are two with which we, as merchants, are brought directly in contact. These are, first, the catalogue houses, who are combining for the purpose of formulating and pushing bills through the Legislature, furthering their scheme for using the postmaster, letter carriers and freight agents to distribute their advertising matter, and converting the United States mail service into freight trains. It will be a sorry day for us if they succeed in passing the Parcels Post bill. Nothing but constant, determined, individual and concerted antagonism on our part will ever block their game. Here is needed the co-operation of the manufacturer, jobber, State and local organizations. Much more could be said on this question, but instead I refer you to the many discussions in the Hardware magazines.

LABOR UNIONS.

The other organization to which I refer is the labor union. There is no class of men that need the benefit of honest and intelligent association any more than do the mechanic and laboring man.

Originally the unions were conducted on this basis, and many are to-day, but some are being deceived by misguided walking delegates, and are resorting to the boycott, blacklist and such means to gain their point.

Hence we read in the daily papers reports of uneasiness concerning the labor question. Strikes are blocking the wheels of progress, and the prosperity we have been enjoying seems tottering on its foundation, and how to meet this problem and solve it right is the question that we must help to answer. We are passing through an industrial and social evolution, bordering on revolution. There will be a readjustment in which the workingman will have his portion of the prosperity he helped to develop, which is his by right of creation. The mischievous walking delegate may delay this realization, but eventually labor will abolish the agitator, and then labor and capital, employee and employer, will walk together in peace. Retail Hardware merchants, because we are not large employers of labor, may think this question does not concern us, but it may not be many days before you will be obliged to meet your few employees to settle the question of more pay, or shorter hours, or both. Organization will help you to meet this question, in a way that will be honorable and straightforward, because you are brought in contact with discussions in various topics along this line, and instead of being a means of antagonism, organization can be made the means to harmonize employer and employee.

These are only a few of the many reasons I could mention for local organization. Time will not permit me to say any more along this line, but I would suggest to the unorganized, isolated solitaire to read and study the reports of Hardware conventions and you will wonder why you have been without an organization in your town or county.

If every city, town and county was locally organized we could dispense with our present organization, and in its stead would have a State convention, consisting of delegates from these local organizations, which, I believe, would be more helpful to all concerned. I would suggest to our president that this question be put before us for discussion at some convenient time.

HOW TO ORGANIZE

and stay is a problem with some, so I will suggest the following rules to govern you:

First. Be careful how you approach your competitor. If you are a good judge of human nature you are all right, but if you have any doubt about co-operation call on some one from the State association to organize you.

Second. If there are only one or two in a village, take in the township or a certain district around you.

Third. Be liberal in your constitution, that it may not be continually annoying you. A good organization will seldom be obliged to refer to its constitution.

Fourth. Don't seek any office, but never refuse to take a responsibility—it is your duty to work for the cause.

Fifth. Avoid electing the same man as president every year. Pass this office around, and whoever has the chair, respect him enough to attend every meeting possible, and help him push.

Sixth. In reporting violation of rules, don't be too harsh with the offender; always give him the benefit of a doubt, customers sometimes lie.

Seventh. Keep your organization in seclusion as much as possible, especially in conversation with your customers. They may get the wrong impression, and make a mountain out of a molehill.

GRAND RAPIDS ASSOCIATION.

In closing I wish to say that we have an organization in Grand Rapids of which I have the honor of being the first president. When we organized, nearly every dealer in the city responded to the call, and signed the constitution. We are meeting with fine success, and it is because we have adhered to the foregoing rules that I am not obliged to make the report that Paddy did when he was asked to break the sad news gently to Mrs. Murphy, on the death of her husband, who had met with an accident. The men were taking the corpse home on a plank, and Paddy preceding them, reached the house and rapped. He asked: "Is this after being Widdie Murphy?" She elevated her head with a toss, and said: "Ye dirthy hathen. I'll be after making that map of Ireland on yer face look like a chunk of sausage. I'm no widdie." "Yous a loier," says Paddy, "for here comes the corpse." No, gentlemen, we are no corpse, but a living organization, and I assure you that should any of you make a visit to Grand Rapids we will do our best to make it pleasant for you.

Looking Both Ways.

BY HENRY C. WEBER, DETROIT.

I need not say to you, gentlemen, for you all realize it yourselves, how difficult it is for one engaged in the active duties of life, especially in the Hardware business, to prepare and deliver any set speech or address on occasions of this kind. The committee has annually found most of the members of this body too busy and has called on me so often that I am afraid that it has fallen into a rut and called upon me again for to-day from sheer force of habit.

LARGE AND NARROW SCOPE.

The subject assigned to me, "Looking Both Ways," is both of a large and very narrow scope; it permits me to talk to you by the hour, or to squint at you cross eyed and sit down. I am wondering which of the two the committee wants me to do, and, if the latter, whether out of charity to you or to me. In this connection I might with profit to myself recall the story of the minister who used to preach by the hour. One Sunday evening after the service there was to be a meeting of the Board of Trustees, and before beginning to preach he announced to the congregation that after the sermon the board was to step forward. He preached according to his custom until the congregation got tired, and when he finished a stranger stepped up to him. The minister asked, "What can I do for you, my dear man?" "Why," he said, "I came up here in response to your request at the opening of the sermon." "Well," said the minister, "You do not belong

to the board." "Oh, yes, I do," he said, "I have been listening to you, and have been bored the last three hours." I won't be quite that bad, I will only keep you for two hours and 55 minutes.

Tennyson in his great poem, "The Charge of the Light Brigade," says, "Looking to the front of us, looking to the rear of us, looking to the right of us, looking to the left of us." It is from these words of the great author, presumably, that the committee wants me to draw my inspiration. If I should lift the veil of time for a moment, and, standing in the radiant light of the great present, look back into the vast abyss of the past, I would be confronted by nothing but darkness, and I would begin to marvel how time has rewarded the labor, intelligence and endurance of mankind and the right use of the means of which we are possessed. Read but the history of our own land and see the

SUCCESSIVE STEPS OF PROGRESS

from the discovery by Columbus to the landing of the Pilgrim Fathers and from then to the days of Washington

HENRY C. WEBER.

and on again to the present day. How the progress of mankind has kept pace with the strides of time. Never have such means and devices for the comfort and betterment of man been thought of as have been invented in the past century. The globe has been encircled with a web work of tracks over which mighty engines drawing palatial cars carry passengers with wonderful rapidity. The ocean is afloat with palaces, which in beauty and elegance can hardly be surpassed. The telegraph and the telephone flash human intelligence to every part of the earth, and the news of the Orient is read at the breakfast table of the Occident. Electricity is only in its infancy, but its performances, even as a child, beggar description. We wonder at the construction of sky scraper buildings and immense bridges and tunnels, which, did we not know them to be a fact, we would challenge as impossibilities.

And as wonderful as all these are the immense intellects that planned and regulated the modern colossal enterprises in the business world. We then ask ourselves, "What is the cause of all this? Whence this wonderful progress?"

THE SOLUTION

seems to be this: Many men gather together for many thoughts, many thoughts develop comprehension, and comprehensive understanding by many often supplies the missing link in the chain of discovery and enterprise. Sameness invariably becomes monotonous, and in this we are supplied with an illustration from remotest history. God was lonesome and he created man, then man become lonesome, so God gave him woman, then both man and woman became lonesome and founded the family—the first organization in history, and I am safe in saying that if it were not for this first organization there would be no Hardware association meeting to-day. From this small institution has grown up the life, the happiness, the intelligence and the power of a world of people, and from this example of combined effort the Hardware association can draw a valuable lesson. In fact, its own experience is a lesson of the same kind. See how it has grown from insignificance to a recognized power, from an uncouth youth to a full grown man. It has taken the timid, the selfish and the strong individuals and combined them into an association that gives strength to all, and not only that but makes us social as well.

We are all more or less helpless without assistance in all walks of life. One has learned by his experience what another has not, and that other has absorbed knowledge which the first one did not learn, and the two together, by an interchange of their ideas, can both become more valuable in their calling.

ASSOCIATION BENEFIT.

The greater the number the greater proportionally is the benefit derived from an association. Number also gives prestige. In your own cities you may have often attended mass meetings when important measures were urged and they were lost, not through lack of forceful presentation by able speakers, nor want of merit, but through lack of interest on the part of the many who did not attend, and thus failed to lend prestige to the occasion.

While the accomplishments of our association have been crowned with success in the past, we ought to show more enthusiasm in the future. One of the greatest factors for good in modern American life is the frequent gathering of representative business men from all parts of the country. It is through this combined social and business interchange at annual conventions that the people of the North and South have been brought closer together, made to understand each other, and that the factional feeling consequent upon the Civil War has been removed.

We have been honored here by the presence of Mr. Bogardus, whose address should be an inspiration to all of us to promote with increased zeal the welfare of our association, for its success is the success of each one of us. It is the barometer, as it were, which reflects the enterprise, the activity and the prosperity of the members who compose it. With the hope that this barometer may always indicate fair weather and a clear atmosphere in the life of the association, I thank you all for your kind attention and the courtesy extended to me.

SAMUEL V. ARMSTRONG, until recently of the firm of Philpot & Armstrong, San Francisco, Cal., and formerly representing Sargent & Co., in Pacific Coast territory, has connected himself with Stanley Rule & Level Company, New Britain, Conn. Mr. Armstrong is now on a trip to the Pacific Coast in the interest of the company, and on his return will make his home at New Britain, being directly connected with the factory.

THE ARTHUR C. HARVEY COMPANY, dealers and importers in Iron, Steel, Metals and Heavy Hardware, who have been located for the past 15 years at 115 Purchase street, have removed to 374-384 Congress street, Boston, where they occupy a new brick building especially planned and built for their use. The new building is 75 x 125 feet, five stories high, equipped with latest appliances for handling and storing the merchandise of the company, including a spur track connected with the New York, New Haven & Hartford Railroad. The space occupied by the offices is ample, affording light and airy rooms for clerks and private apartments for the officers of the company.

THE American Consul at Ascuncion, Paraguay, reports that among the American manufactures that come to that port Barb Wire, by reason of its good and lasting qualities, is more acceptable than that which comes from Europe, although the latter is cheaper. The American Wire is said to give more satisfaction than the Wire of any other country.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C., August 1, 1903.

The Week's Hardware Trade.

AS Monday next is Bank Holiday, there has been some brisking up to get off urgent orders, and this has given an appearance of activity to what is actually a stagnant market. Both in the light and heavy departments trade slackens at a disquieting rate. In the Hardware section there are some exceptions, notably Edge Tools, Hollow Ware, Tubes (at unremunerative prices) and carriage Iron Work. A notable feature just now is the almost abnormal activity in the railroad carriage and motor carriage building trades. The cotton crisis is hitting Lancashire very hard, and this means the pinching of the means of a population exceeding 8,000,000. The depressing effect is keenly felt in all trades and districts. Lancashire is not only a great manufacturing center: its purchases make or mar innumerable subsidiary industries.

An interesting feature of the market just now is the quantity of goods we are sending to America. Although shipments of ore and pig iron have practically ceased, we are busy exporting special Tools and Machinery, Earthen Ware, Copper Goods, Cutlery and Hardware, Needles and Fish Hooks.

Oddly enough, while depression marks the tone of the Hardware and metal working trades generally, there has been a distinct stimulation observable in the Cutlery trade. Cutters in the trade affirm that the past month has exceeded expectations. Orders all round are heavier than for some time past. Ivory is being bought in larger quantities, and the stocks of celluloid are being depleted. Cutlery firms say that orders from South Africa are easily obtained if prompt delivery be guaranteed.

On overseas account not much needs record. In general, it is wise to watch carefully South Africa. There is evidence of overbuying and money stringency. Germany, Belgium and Holland are buying more heavily Machinery, Tools and Guns. Brass and Copper Goods are being bought in good quantities by Turkey and Egypt. From Argentina are coming good orders for Machinery, Implements, Metallic Bedsteads and Wrought Hollow Ware. Brazil's recovery is more tardy. Australian trade continues difficult and irritatingly small. The impoverishing effect of the drought is the main cause, but tariff difficulties and uncertainties play a restrictive part. Japan is buying Naval Ironmongery in fairly heavy quantities. Fairly heavy shipments of Hurdles, Gates, Galvanized Goods, Hollow Ware and Cutlery have been made during the past week or two to China, Hong Kong and other Eastern countries.

The Next Small Arm.

Great interest is being taken in the manufacture of the new Rifle with which British troops, both infantry and cavalry, are to be armed. The delay in making public and in giving out contracts for the new weapon is causing great inconvenience among small arms makers. There is a sort of unwritten law that the Government factory shall make one-half, and outside concerns between them contribute the other half of the requirements of the army in this respect. The fact that the engineers in the Tool shop at Enfield, who for some time have been working day and night in order to expedite the preparatory operations connected with the construction of patterns and machinery, resumed last week their normal hours of labor, may be regarded as evidence that considerable progress has been made, however; although it is reported that the gauges required are still incomplete, and that satisfactory results have yet to be attained in the construction of the nose piece, including the foremost sight of the new arm. Doubtless the War Office has already received reports concerning the results achieved with those specimens of the new Rifle which were issued some time ago for experimental purposes, and will be influenced by these in the initiatory work that remains to be done. Publicity has been given to a suggestion that the effect of using, as it is intended to do, a 25-inch barrel instead of the 30-inch barrel of the present weapon, would be that our troops, in any conflict with forces using the best Continental Rifles, would be under fire for about 500 yards before they could make any effective return; but it may be pointed out that an attempt has been made to increase the velocity of shots from the new arm by an additional twist in the rifling. Another variation from the Lee-Enfield pattern is that the bore is slightly contracted at the central part of the length of the barrel. In the opinion of an expert, the new weapon is unlikely to stand rough usage so well as do the Mauser or the Mannlicher Rifles.

ADVERTISING ADVERTISED.

THE adage which says "You may lead a horse to water, but you can't make him drink" is not always applicable to advertisements, because the public may be induced to read them.

Exciting Curiosity.

To bring the attention of readers of newspapers to his advertisements, as well as nonreaders, E. M. Austin of Litchfield, Ill., has distributed cards, one of which is shown, reduced in size, in the accompanying cut. This

Neighbor Tells Neighbor of Austin's Low Prices.
DON'T SKIP
AUSTIN'S "ADS"
IN OUR THREE WEEKLY PAPERS AND DAILY NEWS, CHANGED EVERY WEEK, THEY TELL OF RARE BARGAINS JUST SECURED.
New Holiday Line
Fancy Satin Lined Cases Containing Toilet, Smoking and Shaving Sets, Collar, Cuff, Handkerchief, Glove and Necktie Boxes, also Celluloid Novelties, Medallions, Mirrors, Etc.
Perfect Plumbing Quick Service Low Charges
AUSTIN Birthplace of Cut Prices
(OVER)

Advertising Advertised.

card, it will be seen, was used to accelerate business during the holidays.

Another card was used at a different time to call attention to his advertisements. This one reads as follows:

ARE YOU READING

AUSTIN'S "ads" in the Semi-Weekly Herald and Monitor, and also both editions of the "News"? Changed every week, they tell you of fresh bargains just secured, and "all agree" no one sells as low as Austin. Don't skip a line of our "ads" or you may skip a dollar.

The other side of this card was used for prices of Crockery, Glassware and miscellaneous small articles.

Readable Advertisements.

It must be borne in mind, however, that no matter how much publicity the advertising of any store may be given the advertisements must be interesting, truthful and timely, to induce the public to continue reading them.

Unseasonable Advertisements,

such as continue to call attention to holiday goods as late as in the spring or summer; or to Lawn Mowers and Garden Hose long after frost has killed all vegetation, only result in ridicule.

No Returns.

Merchants who neglect to change their advertisements are usually the ones who believe that advertising does not do much good. As an example of this, it is related that a man who took charge of a country newspaper found that there was no uniformity in the rates that had been charged advertisers. He sent a revised rate card to each advertiser stating that these rates would prevail in the future. One of the advertisers was a large store, the manager of which returned the card with this written across its face: "Your old advertising is no good, anyway. It has never brought us any returns. Drop our ad." The publisher replied: "My advertising is cer-

tainly as good as your business methods, and I hope much better. That you should have had no returns is in no way remarkable, as you are still running an advertisement describing your Christmas stock and it is now May. Why don't you hire some one to look after your advertising?"

PRICE-LISTS, CIRCULARS, &c.

THE PETERS CARTRIDGE COMPANY, Cincinnati, Ohio, and New York: Talking Points for Salesmen of Peters Cartridges. The booklet contains 18 pages, and presents the subject in a manner calculated to aid the sale of these goods.

SCHATT & MORGAN CUTLERY COMPANY, Titusville, Pa.: Catalogue illustrating an extended line of Pocket Cutlery, Razors and Shears. The company state that all their Blades are forged and tempered by natural gas, are file and wire tested before leaving the factory, and that the goods are sold under an unconditional guarantee.

THE ELLIOTT & REID COMPANY, Richmond, Ind.: Royal Spring Steel Fence circular, relating to the desirability of merchants securing exclusive sale of Royal Spring Steel Fence, Portable Corn Cribs and Royal Fence Stretchers. A large poster illustrates these goods in detail.

THE MOUNT CARMEL BOLT COMPANY, Mt. Carmel, Conn.: Catalogue devoted to illustrations and list prices of Tire, Sleigh Shoe, Stove and Sink Bolts, Stove Rods, Nuts, Rivets, Washers and Machine Screws. Since the company discontinued the manufacture of Wood Screws they have added very materially to their capacity for the production of the before named goods.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Supplementary list of new goods. Illustrations are shown of the Drop Forged Frame and Sliding Breech Block Action on the new No. 44½ Ideal Rifle. The new action is put on all Ideal Rifles, Nos. 44½ to 54 inclusive. The company's Single Trigger Action, Single Barrel Guns with drop forged frame, Nos. 160, 165 and 170, parts for new Rifle and Shotguns are also shown, together with the Stevens-Pope Re and De Capper, Stevens Anti-Rust Gun Grease and Bristle End Cleaning Rod.

THE NATIONAL WHEEL COMPANY, Perrysburg, Ohio: Circulars illustrating with prices Folding Hammock Carts and Steel Express Wagons.

THE 1900 WASHER COMPANY, Binghamton, N. Y.: Illustrated catalogue of the 1900 Ball Bearing Washing Machines. The machine revolves on ball bearings, while the operator sits by its side revolving the tub by the handle, turning it to the right and to the left, about half way round each time. Two oil tempered coiled springs engage at each extreme point and help to reverse the motion.

SAMUEL HARRIS & Co., 23-25 South Clinton street, Chicago, Ill.: Illustrated catalogue and price-list, under date of July 1, 1903, devoted to Tools and Supplies of all kinds for machinists and manufacturers.

THE RED JACKET MFG. COMPANY, Davenport, Iowa: Catalogue and price-list No. 35, devoted to the Red Jacket "So Easy to Fix" Hand and Power Pumps, Pump Cylinders and Supplies, Artesian and Drive Well Cylinders, Valves, &c., and Red Jacket Galvanized Pump Pipe. The catalogue is illustrated with half-tone cuts.

THE FRED. MACEY COMPANY, Grand Rapids, Mich.: Catalogue No. 4 devoted to the Macey Rapid Letter Filing System. Illustrations show Letter Filing Cabinets, Letter File Indexes, Filing Transfer Cases and Desk Files.

WOVEN STEEL HOSE & RUBBER COMPANY, Trenton, N. J.: Catalogue and price-list illustrating Steel Woven Hose especially adapted to pneumatic tools for carrying air, steam or water at highest pressure, Suction, Plain Rubber and Cotton Fire Hose, Belting, Packing, Mats and Matting, &c.

JOSEPH F. MCCOY COMPANY, 157 Chambers street, New York, have issued a revised edition of their illustrated catalogue of foreign and domestic Hardware, Cutlery, Chains, Tools, Machinery and Railway Supplies superseding the issue of 1899, section A. This book, also known as section A, is intended for the convenience of jobbers and retailers interested in these lines of goods, of which the company are importers and dealers.

F. E. KOHLER & Co., Canton, Ohio: Price-list of Strap and T Hinges, Hinge Hasps, Long Chest Hinges, Crate Hinges and Crate Hasps.

THE LUTHE HARDWARE COMPANY, Des Moines, Iowa: Special catalogue of Builders' Hardware, No. 1. This contains illustrations, descriptions and list prices of a varied line of these goods.

FRANK WRIGHT, Cave Springs, Ga.: Fly Escape Screens. Illustrations show perforated steel strips along the upper part of window screens, by which flies escape out of doors. Old screens may be fitted with the Escapes at a small cost.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.: Dixon's Index for Pencil Users. This pamphlet contains suggestions to aid in selecting such Pencils as are best adapted to various kinds of work to give the utmost satisfaction.

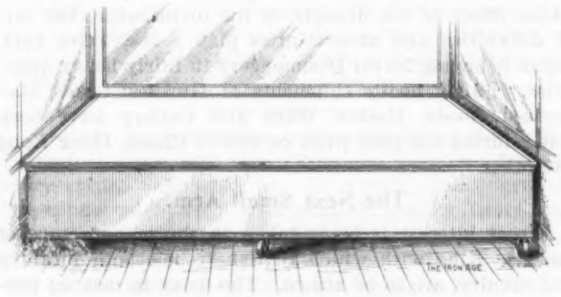
B. B. NOYES & Co., Greenfield, Mass.; Wells Bros. Company, Greenfield, Mass., sales agents: An illustrated catalogue and price-list shows Drilling Machines, Blacksmiths' Drills, Drilling Machine Vises, Countershafts, Bolt Headers, Foot Vises, Swage Blocks, Mandrels, Axle Setter and Straightener. The Drilling Machines have cut gears, which is not common in the class of machines furnished for blacksmiths' and carriage makers' use.

E. C. ATKINS & Co., Indianapolis, Ind.: Revised discount sheet applying to their "Supply Edition" catalogue of 1902.

MOVABLE PLATFORM FOR WINDOW FLOOR.

BY C. F. LUTHY.

LOOKING to the front of our store from the office I have before me a fairly good window. The store is 24 feet in width, with a 5-foot double door on one side and a 3-foot single door on the other. In the center is a window with main plate, 10 x 12 feet. We have a platform shown in the accompanying illustration containing the display that completely fills the window. It is mounted on heavy Casters, so that it can be moved out while the window is being trimmed, thus making the operation easier. The platform stands about 18 inches above the floor, or even with the bottom of the plate glass window.



Movable Platform for Window Floor.

At the time of this writing, March 20, I find the window occupied as follows: Suspended on a tripod in the center of the platform is a 25-gallon Iron Kettle surrounded by several sizes of Sap Pails, a quantity of Syrup Cans and Sap Spouts, Wood Pails, &c. Why is this class of goods in the window now? Because sugar making it at hand. Next week we replace these with a complete line of Kitchen Essentials, including a handsome Steel Range and perhaps a smaller Stove. Why this line? Well, here there is always more or less matrimony and moving about April 1. After that date we will utilize the window by arranging a Plow, Harrow and a general line of Farm Implements. After this comes Paint, Paint Brushes, &c. Then we will fill the window with seasonable summer goods, such as Gasoline Stoves, Oil Stoves, Refrigerators, Ice Cream Freezers and Ice Picks.

A LITTLE EXPERIMENT IN EXPORTING, BUT A VERY UNSATISFACTORY ONE.

BY WM. H. MAHER.

"ONCE upon a time" the ambition of every American voter was to see our great and glorious country become a magnificent exporter. Prosperity was surely to rest upon our banners when all the world turned to us, not alone for wheat, corn, cotton and pork, but for manufactured products of every kind.

When our concern received a foreign letter in our small "emporium of business," we always put the envelope in the window, that the passing voter might see how fast the country was reaching the millennium, and take courage.

Truth compels me to state that most of these letters were from kindly disposed foreigners, who were ready to accept any free samples we might be foolish enough to send them; but we made no note of this on the envelope in the window.

At last, after many years of waiting, a most businesslike looking document came in our mail; it was covered with a variety of postmarks and many different colored postage stamps, and actually contained an order for some goods, in round lots, and what was more to the purpose, a draft on London. Victory was ours!

We called up the city editors of the town and gave them this very important news, and later we were paraded before the public as patriots and benefactors, because of our enterprise in securing magnificent business connections in the far Antipodes—New Zealand.

The order was a fairly good one of its kind, but it really was not the kind we were seeking. It called for four items—none of them the goods of our own brand that we were anxious to export—but items that we were selling at a very close margin, and which were handled by every export house and jobber in New York. The order amounted to $211. A draft for £6 accompanied it; the balance was to be collected by sight draft, with bill of lading attached.

We were so new in this line of world expansion that we felt the need of advice, but a New York firm, to whom we referred the matter, told us we were amply protected and safe in forwarding the goods on this margin.

We ordered the goods from their various makers, the quantities being grosses, where we would have ordered only dozens for our own stock, and then asked for advice from our Eastern friend as to the best exporting house to send the goods through.

We received the name of a concern which was said to be the best, and in answer to our letter we were told by this house that they would take the goods, and make collection for us.

We did not have a brass band head the dray, as it carried the goods to the station, and I can't remember just now why we did not. But we called the attention of all our friends to the fact that these goods were going to Hokitika, New Zealand, and we could see that our importance was visibly increased. This was October 8 (the year does not count), and probably we expected that the returns from that draft of $181.96, after deducting the cash already received, would enable us to buy Christmas presents for our patient though suffering families.

Christmas and New Year's came and went, but the draft didn't. Even the Fourth of July exploded itself in its accustomed way, but Hokitika was silent, until the last of the month, and then we were informed by wire from New York that cable had been received there reading: "We have to advise that after acceptance this bill has been dishonored. Answer: 'Not provided for.'"

We wondered if the concern at New Zealand thought this was the sort of news that one wanted cabled at his expense across the ocean, but further particulars came by mail. We were then told:

"The goods have been stored and insured pending instructions. The bill has been protested for nonpayment in the usual manner. We will be obliged if you will let us know what you wish us to do with these goods. We think that very possibly we could induce some of our friends in Wellington to sell them for your account at no very great loss to yourselves."

We wrote the New York house to sell the goods, by all means, and we once more took courage.

The rest of that year passed out of existence, and in the May following we realized that we were no longer exporters but had gone into quite a different class, being now importers. The communication we received, instead of enclosing a check for the goods that "some of our friends in Wellington" would sell for us, enclosed a bill for $88.63, and read:

"We hand you herewith statement of expenses incurred by ——— & Co., of Hokitika, N. Z., failing to honor your draft, amounting to £39 14s. 3d. Kindly furnish us with your check for $88.63, and on receipt of same we shall make shipment of the merchandise.

"Regretting that your export venture should turn out to be so unprofitable, &c."

Our bill, you remember, was $181.96. The draft as made out by the exporter was for $198.72, or £39 14s. 3d. It seemed to us that we would surely have left off that 3 pence, but the great houses in New York are more particular. There was a question in our minds if that 3 pence was not the real cause of the draft being dishonored.

The bill of expense was a curiosity—it is still, for that matter, and whenever we feel the flame of desire to export arising in our breast we take out that document and study it. This settles it for that period.

This is a copy of the bill—first, we are debited with that draft. We had an idea that we were drawing on the Hokitika chap, but here we are charged with it, and instead of being the $181.96 that we had it, it is now $198.72, the goods having evidently increased in value by going over to New Zealand and back. The next item is, Cable, $7.05. Of course, being an international affair, it was necessary to use the cable to encourage exporting. Then come freight, insurance, protest fees, $15.77; Back charges (guess what that means, we can't), $18.63; Freight to New York, $5.21; Customs entry, New York, $2.50; Insurance on return of goods, $2.35; Cartage, $1; Landing certificate, $5; Protesting draft, $2.14. Total charges, $258.37.

But having charged us for our own goods, we are now made happy by a credit:

"Your invoice October 8, $176.68."

That invoice was certainly one of the queerest we ever made out. It was $181.96 when we wrote it; it was $198.72 when we are charged with it, and then it shrinks to $176.68 when the time comes to credit us with it. It is as elusive as the trick played by the three-card-monte men.

But we are not through with the account yet. Subtracting the reduced invoice from the expanded bill and other items leaves a balance of $81.69. To this is now added: "Interest on $81.69 for 1 year 5 months, at 6 per cent., $6.94."

That last item was an eye-opener as to export trade. Here we were charged for 1 year and 5 months interest on the extra amount added to our own bill (without our knowledge), and on all the charges which had but just been paid in New York.

What did we do?

Why, we protested loud and savagely.

In reply we were told: "The different items of expense, with a few exceptions, are copied from vouchers by the bankers negotiating the draft," and we were told further that we were charged exchange on a draft which was never paid—twice for protest fees; but in the matter of interest the house would throw off $2.94.

If a bill had been made out to us including the charges, pure and simple, the amount would have been $59.65. But by charging us with the expanded invoice for our own goods, and then crediting us with a reduced invoice for the same goods, and adding interest, the amount was swelled to $88.63.

But the exporters had the whip-hand over us, for they were holding our goods all this time; they did not propose to take any chances.

We fancied that perhaps the friend in New York, who had recommended this concern to us in the first place, might help us secure some reduction from what we could not help but think was an unrighteous charge. He wrote us:

"You seem to have had rather an unfortunate experience, and on the face of it, it looks as if you had certainly been overcharged. We know ——— ——— personally, and the writer will take an early opportunity of calling at their office and going into the matter for you."

He reported the result of his interview; no reduction allowed. We sent our check for $88.63, as, somehow in the shuffle, that $2.94 they were going to throw off had disappeared. In due time we received our four cases of hardware.

We did not invite in any friends to welcome the prodigals. We took the boxes in the back way very unostentatiously, and they were opened with no sentiments of tenderness.

And here another experience met us. Notwithstanding the care we used in packing, the goods, as a result of their two long voyages, were rusty and unsalable. And, as I said before, they were not very fast selling goods, either.

I don't care to enlarge on this feature. Every reader of *The Iron Age* knows the pleasure of trying to get rid of rusty goods. We are still working at them in odd moments, and looking for a job-lot man to come around and clean them out at his own price.

We have taken down the word "Exporters" from over the doors. We know when we have had enough. Hokitika settled it for us for all time.

THE SALESMAN AND WESTERN TRADE.

BY FRED. B. ELLSWORTH.

QUESTIONS that impress me forcbily and are often asked me by business men are: Does it pay to send a salesman to the Pacific Coast? What cities should he visit? What does such a trip cost?

Will the Business Pay?

The first question is significant, and depends wholly upon how one interprets it. A salesman may make the trip and do a profitable business, but there are two sides to the question. Many business men figure that if a salesman makes a trip of this kind and fails to make his expenses that this trip has been a failure. I think this is an erroneous idea from a strictly business standpoint, for if a salesman goes over the territory to work up a trade and eventually succeeds in profitably establishing it, the first trip was not a failure.

Traveling Expenses.

The cost of a trip is very difficult to answer intelligently. It depends wholly upon the nature of the business, the number of people to be called upon and the time required.

A Provisional Itinerary, Chicago to Chicago.

With Chicago as a starting point, and bearing in mind that the months of June, July and August are undesirable months to travel in, the following route is suggested:

Via Chicago & Northwestern Railway: St. Paul, Minneapolis.

Northern Pacific Railway: Fargo, Helena (side trip, Butte, $5), Spokane, Seattle, Tacoma, Portland.

Southern Pacific Railway: San Francisco, Los Angeles to San Francisco or Sacramento, Ogden.

Via Denver & Rio Grande Railway: Salt Lake City (Pueblo), (Colorado Springs), Denver.

Via Union Pacific Railway: Omaha.

Via Burlington: St. Joseph, Kansas City, St. Louis.

Via Illinois Central Railroad: Chicago.

Tickets.

For this trip a ticket good for nine months can be had for $136.50. It is good going for 60 days to the return starting point—namely, Los Angeles. A trip of, say, 35 days, can be made comfortably for $350, including the cost of ticket, which does not include Pullman sleepers or meals. Bear in mind, also, that it is a trip made where a man has no sample trunks to harass his progress, and but few people to call on in each city. It is a very fast trip and made under the most favorable circumstances. Other conditions might require several months.

Another Route.

Another route for which a ticket can be had for $110 is as follows:

Via Chicago & Northwestern Railway: Omaha.

Union Pacific Railway Company: Denver.

Denver & Rio Grande Railway: Salt Lake City (Ogden).

Southern Pacific Railway Company: Sacramento, San Francisco, Los Angeles (Maricopa—side trip— to Phœnix and return to Maricopa, $4.20), El Paso, San Antonio, Houston (side trip to Galveston, return to Houston, $2), (side trip Houston to Fort Worth and Dallas, return to Houston), New Orleans.

Illinois Central Railway: Memphis, St. Louis, Chicago.

A Mecca on the Coast.

San Francisco is the objective point of the Pacific Coast, and the principal trade is centered there; but it must be borne in mind that there is little manufacturing being done in the Far West, though it is increasing rapidly. San Francisco has a population of about 350,000, and almost every conceivable kind of business is represented by manufacturers' agents.

One Trip Not a Fair Test.

Many salesmen have made these trips without accomplishing much, and because they have been unsuccessful formed false impressions of the trade, people and country. It is not to be supposed that a salesman going over new territory for the first time can accomplish wonders. About the best he can do is to get acquainted with the trade. Then if he has a good line, calls on the trade in a systematic manner, perseveres and sticks to it, his efforts will eventually be rewarded. There is this to the credit of Western business men. They are good pay, and once you get to doing business with them, furnish good goods and do business on correct principles, you will, all things considered, be able to retain a satisfactory portion of their trade.

FINE CUTLERY SETS LEATHER CASED.

HERMANN BOKER & CO., 101-103 Duane street, New York, have imported a very complete and comprehensive line of Scissors in cases, Manicure Sets for ladies and gentlemen, ladies' Sewing Sets, Shaving Outfits, together with gentlemen's Traveling and Manicure Sets, having their well-known Tree brand, which is symbolical of their best quality. These various classes of goods are put up in fine leather cases, including morocco, Russia, lizard, embossed calf or Art Nouveau, genuine seal, alligator and pigskins. The Razors are in pairs, three and four pieces and seven-day sets. The Manicure and ladies' Sewing Sets have ivory, pearl and ebony handles. This line is now in stock for the fall and holiday trade, and an interesting feature is that while of excellent quality, they are reasonably priced.

THE OLIVER NEWS.

THE July issue of the F. W. Oliver Company's quarterly paper is particularly interesting for two reasons. The first is the announcement of a new feature, that of giving a trading stamp with each dime's worth of goods bought at the company's store at regular prices. The second reason is the number of new and seasonable goods illustrated. The company are located at Niagara Falls, N. Y., and issue the *News* in April, July, September and November, which they have done for five years.

ALLITH MFG. COMPANY, Chicago, Ill., have decided to establish a branch factory at Hamilton, Can. The plant will be located temporarily in the Leitch & Turnbull Elevator Works. The company desired to make an early start, and this was the only available building. The necessary machinery is now being installed, and opera-

tions will be begun in a short time. The Canadian plant will be of the same capacity as the Chicago factory—namely, 40 dozen pairs of Hangers per day.

REMINGTON ARMS COMPANY'S NEW CATALOGUE.

THE REMINGTON ARMS COMPANY, Ilion, N. Y., and 313-317 Broadway, New York, have just issued a fine catalogue of their product. It is handsomely printed and illustrated, the various Double and Single Barrel Shot Guns, Military, Target and Sporting Rifles, Magazine Guns and Carbines, Target Pistols, Double Derringers, &c., being exhaustively shown. A third of the book of 64 pages is assigned to copious illustrations of the various Firearms shown in the front of the book, together with Auxiliary and Reloading Tools, *fac-simile* illustrations of the numerous Cartridges used with the different arms, and a table showing 40, 60, 75 and 100 per cent. number of pellets in loads of shot from ⅞ to 1½ ounces.

Thin Decorated Pen Knives.

Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels (Solingen, Germany) "Twins" brand cutlery, have brought over a line of new pocket knives having some novel features. There are about ten sizes and styles in all, one of which, here illustrated, is typical with modifications as to size, number and kind of blades and decoration of the general scheme of the group. All are extremely thin, only about ⅛ inch thick, have German silver sides, artistically etched in rich colors against a background of gold, the process of which is such that the colors are guaranteed by the house to hold true, and that the sides will not rust or discolor. The knives vary somewhat in length and the number and character of the blades, the one here shown being 3¼ inches long with four blades. It will be seen there are two blades on each side; a long thin and short pen blade on one side and a short pen and a file blade on the other. In this example an American flag is shown, the American eagle being on the reverse; another has an American shield, &c., all in *fac-simile* colors. The knives vary in length, closed, from a ladies' knife, 2 inches long, to champagne knives, about 3½ inches long, closed. The pen knives have variously two, three and four blades, according to cost.

Thin Pen Knife, Etched in Fac-Simile Colors, Actual Size.

The champagne knife has a large and small blade, cork screw and wire cutter.

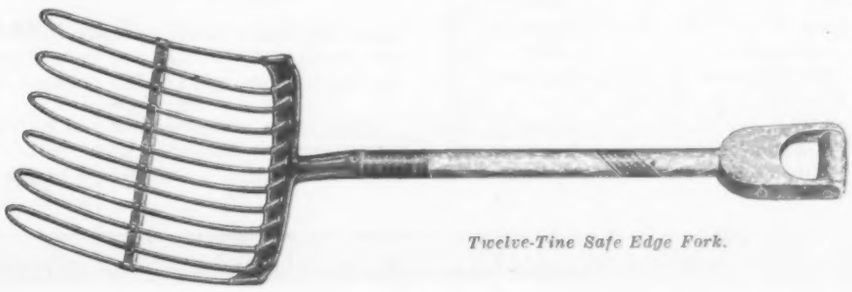
Little Giant Stock and Screw Plates.

Wells Brothers Company, Greenfield, Mass., New York office at 56 Reade street, with A. Z. Boyd, have recently put on the market a screw plate stock having some elements of novelty, as here shown. The handles are knurled to prevent slipping, and the plate holder is handsomely case hardened, which adds much to its attractivness and salability. The No. 50 screw plate set in a box contains two stocks, one 26 inches long for the first nine sizes, ¼ to 1 inch, inclusive, and the other 52 inches long, for the 1⅛, 1¼, 1⅜ and 1½ inches sizes. There are also two adjustable tap wrenches and collets 2¾ and 4½ inches in diameter. There are other assortments, 20 in all, in various combinations from ⅛ to ¼ inch by thirty-seconds up to the No. 50 here described, which is the most comprehensive in range of all.

Little Giant Case Hardened Screw Plate Stock.

Twelve-Tine Safe Edge Fork.

The Cleveland Lock Company, Cleveland, Ohio, are offering the safe edge fork shown herewith. It is made of the best stock, is strong, and each tooth has the combined strength of two teeth. It is designed for use with vegetables, beets, fruit and as a general utility fork. The forks have a blue finish from the socket half way down, the balance being a heavy transparent lacquer to prevent rust. The goods are neatly labeled and packed.



Twelve-Tine Safe Edge Fork.

Combination Clamp and Bench Vise.

The combination clamp and bench vise shown in the accompanying cuts is put on the market by R. H. & J. G. Makowsky, New Haven, Conn., with Brooklyn office at Morgan avenue and Mesorole street. The adjustable jaws of the device, as illustrated in Fig. 1 are malleable

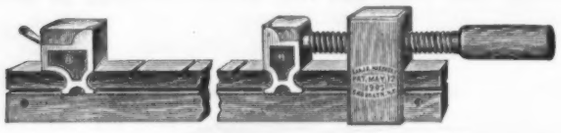


Fig. 1.—Combination Clamp and Bench Vise.

iron faced, connected with a bar of maple 1⅝ x 2¼ inches in size. In use, the jaw at the left is moved up to the work, and is held in place by a small lever. The screw is then tightened as desired. The clamp is furnished with wood or iron screws, as ordered. In Fig. 2 the clamp is shown attached to a bench for use as a bench vise, for which purpose two malleable iron slide ways and two clamping bolts with thumb nuts form a set, and are known as a bench attachment. The malleable slide ways can be secured to the bench and receive the heads of the clamping bolts, which pass through the bar near the ends. It is obvious that the clamp may be raised or lowered as the work in hand may require. The point is made that when attached to a bench the clamp will enable the operator to turn out as perfect work as with a high priced cabinet maker's vise. The bars are of the best maple, shellac finish, with jaws malleable iron faced, polished and japanned. The clamps are made in four sizes: 3½, 4½, 5½ and 6½ feet, and are designed for use by cabinet, carriage and pattern makers, carpenters and other mechanics. The shortest clamp is designed to retail at $2 each, and the longer ones at a small additional price per foot. The bench attachments are designed to retail at 50 cents per set.

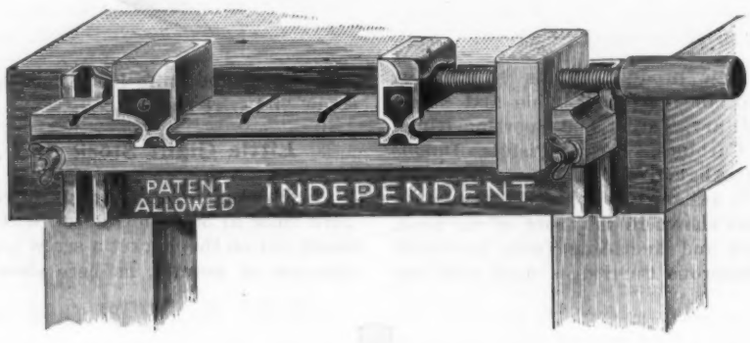
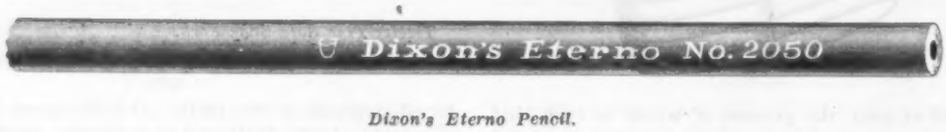


Fig. 2.—Combination Clamp Attached to Bench.

Dixon's Eterno Pencil.

Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, have just brought out Dixon's Eterno pencil, as here illustrated. Outwardly, it is similar in size and appearance to other pencils regularly made. The novel features of this product relate to the various uses to which it can be put. It can be used, for instance, for all ordinary purposes, as though it was the conventional black pencil. It writes such a dark purple as to be practically black. The lead, so called, is of peculiar smoothness and toughness, writing freely and smoothly, at the same time carrying and holding a good, sharp point. Another peculiarity is that it leaves an indelible mark, and can be used for legally signing checks acceptable to banks, prescriptions, salesmen's orders, buyers' receipts, bills of lading, invoices, and any writing the record of which necessitates permanency. In other words, it gives the convenience of the pencil and the lasting quality of ink work. Moreover, letters or documents so written can be easily and legibly copied, the characters then becoming purple and sharp in outline. This obviates the necessity of special copying ink on desks, and is always available indoors or out of doors. Its principal component parts are straight grained Florida cedar and pure Ticonderoga graphite, combined with the best colors so blended by a secret process as to insure distinct black writing, purple copying and indelibility, and at a cost no greater than that of any good pencil.



Dixon's Eterno Pencil.

Heavy Hack Saw Frames.

The Goodell-Pratt Company, Greenfield, Mass., are bringing out the line of heavy hack saw frames shown in the accompanying cuts. The No. 14 is 5¼ inches deep, and the No. 15, 10¼ inches deep. Both are designed for heavy work, and are furnished with one 12-inch blade. The frames are made entirely of steel, except the handles, and are full polished and nickel plated.

Fig. 1.—Heavy Hack Saw Frame No. 14.

Fig. 2.—Heavy Hack Saw Frame No. 15.

FRED. BUCK, vice-president and manager of the Lufkin Rule Company, Saginaw, Mich., sailed for Europe July 23 on the "Celtic," accompanied by his wife and daughter. Mr. Buck expects to be on the other side several months, and will divide his time between business and pleasure.

Current Hardware Prices.

REVISED AUGUST 11, 1903

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

damite in Carloads:
Crystal ₱ ton $90@100
Grain ₱ ton $130@140
See also *Emery.*

Adjusters, Blind—

Domestic, ₱ doz. $9.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent 25&5%
Taplin's Perfection 25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₱ lb 8½@8¾c
Buel Patent Trenton ₱ lb 9½@9¾c
Eagle Anvils ₱ lb 7¾@7¾c
Hay-Budden, Wrought 9@9¼c
Horseshoe brand, Wrought 9@9¼c

Imported—

Peter Wright & Sons ₱ lb 10½c

Anvil, Vise and Drill—

Millers Falls Co., $18.00 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots 20%
Lots of 3 doz. 30%

Augers and Bits—

Com. Double Spur 70&10@75%
Boring Machine Augers 66⅔@70%
Car Bits, 12-in. twist 60@60&10%
Jennings' Pattern 50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25&10%
No. 30, R. Jennings' List 40&7½&10%
Russell Jennings' 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26 50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut gro. $2.75@3.00
German Pattern gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled gro. $2.75@3.00
Unhandled, Shouldered gro. 63@66c
Unhandled, Patent gro. 66@70c
Pig Awls:
Unhandled, Patent gro. 51@54c
Unhandled, Shouldered gro. 63@70c
Scratch Awls:
Handled, Common gro. $3.50@4.00
Handled, Socket gro. $11.50@12.00
Rosewood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands $5.50
First Quality, jobbers' brands $5.00@5.25
Second Quality $4.50@4.75

Axle Grease—See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar 4½@5c
Concord, Solid Collar 5¼@5½c
No. 1 Common 3¾@4 c
No. 1 Com. New Style 3¾@4 c
No. 2, Solid Collar 4¼@4½c
Nos. 11 to 14 60&10&10@70%
Nos. 15 to 18 %
Nos. 19 to 22 70&10&5%
5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned lb. 4½@5¼c
Common and Concord, turned lb. 5@5¼c
Half Patent lb. 9@9½c

Balances—Sash—

Caldwell new list 50%
Pullman's 60%

Spring—

Spring Balances 60@60&5%
Chatillon's:
Light Spg. Balances 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%
Pelouze 50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb 3@3½c

Towel—

No. 10 Ideal, Nickel Plate ₱ gro. $8.50
No. 20 Ideal, Brass Finish ₱ gro. $8.50

Baskets—

Hoffman's Brick Baskets each $3.25

Beams, Scale—

Scale Beams, List Jan. 12, '82 40&10%
Chatillon's No. 1 30%
Chatillon's No. 2 40%

Beaters—Egg—

Lightning Chain, ₱ doz, $1.15; ₱ gro. $12.00
National Mfg. Co.: ₱ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₱ gro.
No. 60 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd $8.00
No. 100 Improved Dover $8.00
No. 102 Improved Dover, Tin'd $9.50
No. 150 Improved Dover, Hotel $15.00
No. 152 Imp'd Dover, Hotel, T'd $17.00
No 200 Imp'd Dover Tumbler $9.00
No. 202, Imp'd Dover Tumbler, Tin'd $10.00
No. 300, Imp'd Dover Mammoth, ₱ doz $27.00
Wonder (S. S. & Co.) ₱ gro. $6.00

Bellows—

Blacksmith, Standard List 75@75&5%

Blacksmiths'—

Inch	30	32	34	36	38	40
Each	$3.50	3.75	4.25	4.80	5.35	6.15

Extra Length:
Each $4.00 4.55 5.10 5.60 6.40 7.50

Net Prices.

Molders—

Inch	10	12	14
Doz	$8.50	10.00	13.00

Hand—

Inch	6	7	8	9	10
Doz	$5.25	4.50	5.00	6.50	7.75

Bells—Cow—

Ordinary goods 75&5@75&10%
High grade 70&10@70&10&5%
Jersey 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 35%

Hand—

Hand Bells, Polished 60&5@60&10%
White Metal 55@55&10%
Nickel Plated 50@55&5%
Swiss 60@60&5%
Cone's Globe Hand Bells 33⅓@33⅓&10%
Silver Chime 33⅓@33⅓&10%

Miscellaneous—

Farm Bells lb. 2@2½c
Steel Alloy Church and School 60%
American Tube & Stamp'g Co. Gongs 70%
Trip Gong Bells 55&10&60%

Belting—Rubber—

Agricultural (Low Grade) 75@75&5%
Common Standard 70@70&10%
Standard 65@70%
Extra 60&5@60&10%
High Grade 50&5@50&10%
Boston Belting Co.:
Seamless Stitched Imperial 45&5%
Boston 50&5%
Niagara 60&5%

Leather—

Extra Heavy, Short Lap 60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard 70@70&5%
Light Standard 70&10%
Cut Leather Lacing 60&10%
Leather Lacing Sides, per sq. ft. 13c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden 70&10@75&5%
Hollow Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron 50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c. 30&10@40&10%

Bolts—

Carriage, Machine, &c.—

Common, list Feb. 1, '02 60&10@65&5%
Phila. Eagle, $5.00 list May 24, '99 80@80&5%
Bolt Ends, list Feb. 14, '95 65&5@65&10%
Machine, list Oct. 1, '99 65@65&5%
Machine with C & T. Nuts 60@3¼@..%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	3	4	5	6	8
Per doz	$0.26	.30	.39	.47	.65

Cast Iron Spring Foot:

Inch	6	8	10
Per doz	$1.00	1.25	1.75

Cast Iron Chain, Flat, Japanned:

Inch	6	8	10
Per doz	$0.75	1.05	1.30

Cast Iron Shutter, Brass Knobs:

Inch	6	8	10
Per doz	$0.57	.80	1.00

Wrt Barrel, Jap'd 75&10@75&10&10%
Wrought Bronzed 50&5@50&10%
Wrought Flush, B. K. 50&10@60&10%
Wrought Shutter 50&10&10@60&5%
Wrought Square Neck 50@50&10%
Wrought Sunk, Flush 50@50&10%
Ives' Patent Door 60%

Stove and Plow—

Plow 60@60&5%
Stove 80@80&10%

Tire—

Common 72½@72½&10%
Norway Iron 80@80&5%
American Screw Company:
Norway Phila., list Oct. 16, '84 80%
Eagle Phila., list Dec. 28, '99 72½%
Bay State, list Dec. 28, '99 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 80%
Eagle Phila., list Oct. 16, '84 82½%
Eclipse, list Dec. 28, '99 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 72½%
Norway Phila., list Oct. '84 80%
Unson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	1¼	1½	1¾	2
Per doz	$4.30	5.00	5.75	7.25
Inch			2¼	2½
Per Doz			$8.65	11.50

Enterprise Mfg. Co., No. 1, $1.35; No. 2, $1.65; No. 3, $2.50 each 35%

Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Schatz 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American $1.15@1.25
Barber's 50&10&10&60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, $1 to 123, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent 50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10&65%

Brackets—

Wrought Steel 80@80&5%
Bradley's Wire Shelf:
Full cases 80&10&10%
Broken cases 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets 70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co. 75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks Saw—

Hoosier ₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96 30@30&10%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad 50@50&10%
Fast Joint, Narrow 50@50&10%
Loose Joint 50&5@70&10%
Loose Pin 70&5@70&10%
Mayer's Hinges 70&5@70&10%
Parliament Butts 70&5@70&10%

Wrought Steel—

Table and Back Flaps 75%
Narrow and Broad 75%
Inside Blind 75&10%
Loose Pin 75&10%
Loose Pin, Bali and Steeple Tip 65%
Japanned, Ball Tip Butts 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts 55&10%
Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze:
700, 800 series 40&10%
Hendryx Enameled 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong per lb. 4@4¼c
Sharp, 1 prong per lb. 4½@4¾c
Perkins' Blunt Toe ₱ lb 3½c
Perkins' Sharp Toe ₱ lb 4 c

Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons per doz $2.00

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro

Caps—Percussion—

Eley's E. B. 60c
G. D. .....*per M* 34@35c
F. L. .....*per M* 40@45c
G. E. .....*per M* 50@55c
Musket .....*per M* 62@63c

Primers—

Berdan Primers, $1.00 per M 5%
B. L Caps (Sturtevant Shells) $1.00 per M 5%
All other primers per M.$1.22@$1.27

Cartridges—

Blank Cartridges:
22 C. F., $5.50 .....10c&5%
38 C. F., $7.00 .....10c&5%
22 cal. Rim, $1.50 .....10c&5%
32 cal. Rim, $2.75 .....10c&5%
B. B. Caps, Con., Ball Swgd $1.90
B. B. Caps, Round Ball $1.40
Central Fire 25%
Target and Sporting Rifle .....15c&5%
Primed Shells and Bullets .....15c&10%
Rim Fire Sporting 50%
Rim Fire, Military .....15c&5%

Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

Casters—

Bed .....70@70c&10%
Plate .....60@60c&5%
Philadelphia .....75@75c&10%
Boss .....70&10%
Boss Anti-Friction .....70&10%
Martin's Patent (Phœnix) 45%
Standard Ball Bearing 45%
Tucker's Patent low list 30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.50	5.50	4.40	4.00	3.80	3.70	3.65
⅝	¾	⅞	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil .....60 & 10c&10%

Halters and Ties—

Halter Chains .....60c&10@60c&10c&10%
German Halter Chains, list July 24, '97 .....60c&10c&10@70c&10%
Cow Ties .....60@60c&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$26.00
6½—6-2, Straight, with ring.. $26.50
6½—8-2, Straight, with ring.. $30.00
6½—10-2, Straight, with ring..$35.00
Add 2¢ per pair for Hooks. Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.. 60@60c&10%

Miscellaneous—

Jack Chain, list July 10, '93 :
Iron .....60c&10@60c&10c&10%
Brass .....60c&10@60c&10c&10%
Safety Chain .....70c&10@75c&5%
Gal. Pump Chain .....*lb.* 4½@4¾c
Covert Mfg. Co.
Breast .....40&2%
Halter .....40&2%
Heel .....40&2%
Rein .....40&2%
Stallion .....40&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. Coil and Halters .....40@45&5%
Am. Cow Ties .....45@50%
Eureka Coil and Halter .....45@50&5%
Niagara Coil and Halters .....45@50&5%
Niagara Cow Ties .....45&5@50&10&5%
Wire Dog Chains .....45@50&5%
Wire Goods Co.:
Dog Chain .....70&10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)

Carpenters' Blue .....gro. 40c
Carpenters', Red .....gro. 35c
Carpenters', White .....gro. 30c
See also Crayons.

Checks, Door—

Bardsley's .....40&10%
Columbia .....50&10%
Eclipse 60%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc., Chests, with Tools 30%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests .....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List .....70@70c&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 .....60&10%
C. E. Jennings & Co. Socket Framing No. 15 .....60&10%
Swan's 70%
L. & I. J. White .....30@30&5%

Tanged—

Tanged Firmers .....40c&5@40&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 191, 181 .....16⅔&10%
L. & I. J. White, Tanged .....25&5%

Cold—

Cold Chisels, good quality..lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary .....lb. 9 @10c

Chucks—

Beach Pat., each $8.00.. .....35&5%
Pratt's Positive Drive 25%
Empire 25%
Blacksmiths' 25%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard..30%
Drill Chucks, New Model 25%
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 40%
Czar Drill 30%
Geared Scroll 30%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%
Wescott Patent Chucks:
Lathe Chucks 50%
Little Giant Auxiliary Drill 40%
Little Giant Double Grip Drill 40%
Little Giant Drill, Improved 40%
Oneida Drill 40%
Scroll Combination Lathe 40%

Clamps—

Adjustable, Hammers' .....20@20&5%
Cabinet, Sargent's .....50&10%
Carriage Makers', F., S. & W. Co. 50%
Carriage Makers' Sargent's 60%
Besly, Parallel .....33⅓&10%
Linemans, Utica Drop Forge & Tool Co. 40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable 55%
Iwan's Champion, Stationary 40%

Sidewalk—

Star Socket, All Steel...℔ doz. $4.05 net
Star Shank, All Steel...℔ doz. $3.24 net
W. & C. Shank, All steel, 7½ in. ℔ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—

Foster Bros 30%
New Haven Edge Tool Co.'s 45%
Fayette R. Plumb... .....33⅓@33⅓&10%
P., S & W .....50@50&5%
L. & I. J. White 30%

Clippers—

Chicago Flexible Shaft Company
'98 Chicago Horse $8.75
1902 Chicago Horse $10.75
Lightning Belt $15.00
Chicago Belt $20.00
Stewart's Patent Sheep $18.50
(15%)

Clips Axle—

Eagle and Superior ¼ and 5-16 inch .....70c&10%
Norway, ½ and 5-16 inch..70@70c&10%

Cloth and Netting, Wire —See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.... 65c&10@70%
Globe, Kerosene, Racking, &c., Cocks .....65c&5@70c&5%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—

Brass, Walter B. Stevens & Son's list. 40%
Embossed, Gilt, Walter B. Stevens & Son's list .....30&10%
Leatner, Walter B. Stevens & Son's list 40%

Combs Mane and Tail—

Covert's Saddlery Works .....60&10%

Compasses Dividers, &c.

Ordinary Goods .....75@75c&5%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%
J. Stevens A. & T. Co .....5&10%

Compressors Corn Shock—

J. B. Hughes' ℔ doz $2.50

Conductor Pipe, Calva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
Eastern	7.4c&12½&5%	70c&7½&5%
Central	7.4c&7½&5%	70&5%
Southern	65c&10%	65c&5%
S. Western	65c&7½&5%	65c&2½&5%

Terms, 2% for cash. With delivery on full crates.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	2	3	4	6	8	
Labrador	$1.20	$1.50	$1.80	$2.10	2.70	
Gal.	3	4	6	8		
Iceland, ea.	$1.80	$2.10	$2.40	$3.00		
Gal.	2	3	4	6	8	
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90	25%

Ga.v. Lined side handles

Gal.	2	3	4	6	9	
Each.	$1.95	$2.15	$2.40	$3.30	$4.15	25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab .....*lb.* 27@28c
Braided, White, Com .....*lb.* 19@22c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India .....*lb.* 10@10½c
Cotton Sash Cord, Twisted ....16@2.c
Patent Russia .....*lb.* ..@13c
Cable Laid Russia .....*lb.* ..@14c
India Hemp, Braided .....*lb* ..@18c
India Hemp, Twisted .....*lb.* 12@13c
Patent India, Twisted .....*lb.*12@13c
Anniston Cordage Co.:
Old Glory, Nos. 7 to 12 .....℔ ℔ 24 ¢
Anniston, Nos. 7 to 12 .....℔ ℔ 19 ¢
Old Colony, Nos. 7 to 12 .....℔ ℔ 18½¢
Anniston Drab, Nos. to 12 .....℔ ℔ 24 ¢
Pearl Braided, cotton, No. 6 ℔ ℔, 20¢; Nos. 7 to 12, 19¢.
Massachusetts, White .....℔ ℔ 22½¢
Massachusetts, Drab .....℔ ℔ 26½¢
Eddystone Braided Cotton .....℔ ℔ 19¢
Harmony Cable Laid Italian .....℔ ℔ 18¢
Ossawan Mills:
Crown, Solid Braided White...℔ ℔ 22¢
Braided, Giant, White .....℔ ℔ 20¢
Peerless:
Cable Laid Italian .....16¢
Cable Laid Russian .....14¢
Cable Laid India .....12¢
Braided India .....18¢
Phœnix, White .....19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton .....℔ ℔ 32½¢
Braided, Italian Hemp...℔ ℔ 32½¢
Braided, Linen .....℔ ℔ 49¢
Braided, White Cotton, Spot. ℔ ℔ 28½¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ 15%
A quality, White, 35¢ 15%
B quality, Drab, 35¢ 15%
B quality, White, 30¢ 15%
Italian Hemp, 40¢ 15%
Linen, 57½¢ 15%

Wire, Picture—

List Oct., '00 .....85c&10@85c&10c&5%

Crackers, Nut—

Little Giant .....℔ gr. $24.00

Cradles—

Grain 50%

Crayons—

White Round Crayons, gross.5½@6c Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square .....gr. $1.50
Rolling Mill Crayons .....gr. $2.50
Railroad Crayons (composition) gr. $2.00
(Case lots 20%)
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy .....℔ doz. $7.00
Fort Madison, Light .....℔ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden 50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847...℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....℔ doz. $3.00
Wm. Rogers & Son .....℔ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....℔ doz. $3.00
No. 77 Medium Knives.....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co 40%
Red Devil 50%
Smith & Hemenway Co 70%
Woodward 40%

Meat and Food—

Hale's., Nos.. *111* *112* *113*
Per doz .. *$8.10* *9.90* *13.50*
American 30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$80

Enterprise .....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's, ℔ doz .....30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ℔ doz. $23.75 .....50&10%
Little Giant, ℔ doz .....33⅓&5@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$73.00	$68.00

N. E Food Choppers 40%
Sterling .....40@40&10%

No.	1	100	150
	$2.00 each	No. 2 ..$2.50 each	

New Triumph No. 605, ℔ doz. $24.00 .....30&10@40%
Woodruff's, ℔ doz .....30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers .....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9..55%
Kraut Cutters 36 x 12, 40 x 12 .....40%
Sterling, $6.00 each 33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ℔ gr....$18@$20
Slaw Cutters, 2 Knife, ℔ gr....$22@$36

Tobacco—

All Iron, Cheap .....*doz. $1.25@$1.50*
Enterprise .....25@50%
National, ℔ doz. No. 1, $21; No. 2, $18..40%
Sargent's, ℔ doz., No. 2 .....60%
Sargent's No. 12 and 21 .....60%

Washer—

Appleton's, ℔ doz. $16@00 .....50&10%
Bonney's 40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz.. $9.00
Iwan's Improved Post Hole Auger. 40&5%
Iwan's Vaughan Pattern Post Hole Augers, ℔ doz $6.75
Iwan's Perfection Post Hole Digger... ℔ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ℔ doz $7.50
Kohler's Universal .....℔ doz, $15.00
Kohler's Little Giant .....℔ doz. $12.60
Kohler's Hercules .....℔ doz. $10.00
Kohler's Invincible .....℔ doz. $9.60
Kohler's Rival .....℔ doz. $8.50
Kohler's Pioneer .....℔ doz. $7.50
Never-Break Post Hole Diggers, ℔ doz. $24.00 .....60%
Samson, ℔ doz. $34.00 .....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in. .....℔ doz, $10.50
Phillips', style 077, ¾ in. .....℔ doz, $8.00
Phillips', style x-y, ⅞ in. .....℔ doz, $11.00
Porter's Plain, No. 6 .....℔ doz. $6 75
Porter's Ornamental, No. 70. ℔ doz. $10.50
Porter's No. 99 .....$9.00
Porter's No. 44 .....$10.75

Drawers, Money—

Sun Money Drawers, No. 5, ℔ doz. $9.
No. 6, with Bell, $ 0.00; No. 6, with Gong $ 0.50.
Tucker's Pat. Alarm Till No. 1, ℔ doz. $18; No. 2, $15; No. 3, $12; No. 4, $1

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill..each $1.50@$1.7
Breast, Millers Falls .....15&1
Breast, P., S. & W .....40&
Goodell Automatic Drills..40&5@40&1
Johnson's Automatic Drills Nos. 2 and 3 .....16⅔&5&1
Johnson's Drill Points .....16⅔&5&1
Millers Falls Automatic Drills...33⅓&1
Ratchet, Curtis & Curtis 2
Ratchet, Parker's 4
Ratchet, Weston's 3
Ratchet, Whitney's, P.S. & W 50
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 .....33⅓

Twist Drills—

Bit Stock .....60c&10@60c&10c&1
Taper and Straight Shank .....60c&10@60c&10c&5

Drivers Screw—

Screw Driver Bits..per doz. ..45@75c
Balsey's Screw Holder and Driver, ℔ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9. 40%
Buck Bros 30%
Buck Bros' Screw Driver Bits 30%
Champion 50%
Edson 60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet 35%
Goodell's Auto 50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle 50%
Mayhew's Monarch .....40&10%
Millers Falls, Nos. 20 and 21 .....25&10%
Millers Falls, Nos. 11, 12, 41, 42 .....15&10%
Never Turn 60%
New England Specialty Co 50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 .....60%
Nos. 20 and 40 .....70%
Smith & Hemenway Co .....60&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 30@60&10&10%
No. 86 .....70@70&10&10%
Swan's:
Nos. 65 to 68 .....50%
No. 40 .....40&10%
Nos. 25, 35 and 45 .....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*
Eastern	75c&10&2½%
Central	75c&12½%
Southern	75c&2½%
S. Western	75%

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments 60%
Perfect Elbows (S. S. & Co.) 30%

Emery, Turkish—

	4 to 6	5½ to 150	Flour
Kegs	*lb.* 5c	5½c	3½c
½ *Kegs*	*lb.* 5½c	5¾c	3¾c
Kegs	*lb* 5c	6c	
10-lb cans, 10 in case	6½c	7c	6c
10-lb. cans, less than 10	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's .....50&10%
Walling's 50%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined .....50@50c&10%
Metallic Key, Leather Lined .....70@70c&10%
Red Cedar .....40@40c&10%
Petroleum .....70c&10@75%
B. & L. B. Co.:
Metal Key .....60&10%
Star 60%
West Lock .....50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's L. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection Cedar 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved, ¼ and ⅜ inch 35%
Self Measuring:
Enterprise, ℔ doz. $30.00 .....40&10%
Lane's, ℔ doz. $30.00 .....40&10%
National Measuring, ℔ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands .....70c&5@70c&10c&5%
Standard Brands .....75c&5@75c&10c&10%
Second Quality .....75c&10c&10@80c&5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 .....30%

Fixtures, Grindstone—

Net Prices:

Inch	15	17	19	21	24
Per doz.	$2.85	3.00	3.50	4.00	4.75

P., S. & W. Co .....30&10@40%
Reading Hardware Co 60%
Sargent's .....60&10&10%
Stowell's Giant Grindstone Hanger.... ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures Light .... 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—*Aug. 1, 1899, list.*
Hay, 2 tine.....60%
Hay 3 tine.....60&10%
Hay, 4 tine.....60&5%
Hay, Header and Baler 3 tine 60&15%
Hay, Header and Baler, 4 tine 60%
Grain or Barley.....70%
Manure, 4 tine.....60&20%
Manure, 5 and 6 tine.....60&20%
Spading.....70&5%
Extra 10%
Iowa Dig-Ezy Potato.....65%
Victor, Hay.....60%
Victor, Manure.....60%
Victor, Header.....60%
Champion, Hay.....60%
Champion, Manure.....60&20%
Columbia, Hay.....60%&5%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&10&7½%
Acme Manure, 4 tine.....60&20&10%
Acme Manure, 6 tine.....60%&10&2%
Dakota Header.....65&15&5%
Jackson Steel Barley.....65&15&5%
Kansas Header.....60%
W. & C. Favorite Wood Barley 4 tine, ₩ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons*.

Fountains, Stock—
Double Dewey....₩ doz. $36.00.....20%

Frames— Saw—
White, Straight Bar.....75@80c
Red, Straight Bar.....$1.00@$1.25
Red, Double Brace.....$1.40@1.50

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best..	$1.45	1.65	1.95	2.40	3.20	4.00
Good	$1 25	1.50	1.80	2.00	2.70	3.60
Fair..	$1.00	1.10	1.30	1.75	2.30	2.90

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly*.

Fry Pans—See *Pans, Fry*.

Fuse— *Per 1000 Feet.*
Hemp Fuse.....$2.60
Cotton Fuse.....2.90
Single Taped Fuse.....3.25
Double Taped Fuse.....4.20
Triple Taped Fuse.....5.00
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80@80&10%

Gauges—
Marking, Mortise, &c......50&10@50&10&10%
Chapin-Stephens Co.:
Marking, Mortise, etc.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....5@50&10%
Fulton's Butt Gauge.....30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P. S. & W. Co.....30&10%

Gimlets— Single Cut—
Nail, Metal, Assorted, gro. $1.40@1.50
Spike, Metal, Assorted gro. $2.80@3.50
Nail, Wood Handled, Assorted. gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $3.25@3.50

Glass, American Window
Jobbers' List, Dec. 16, 1902.
Single and Double:
From store, First Three Brackets.. 90&5%
From store, all sizes above....90&15%

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10&10%

Glue—Liquid, Fish—
Bottles or Cans, with Brush....25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's).....40&10&50%

Grease, Axle—
Common Grade.....*gro. $4.70@5.50*
Dixon's Everlasting....10-₺ pails, ea. 85¢
Dixon's Everlasting, in bxs..₩ doz. 1 ₺ $1.20; 2 ₺ $2.00

Griddles, Soapstone—
Pike Mfg. Co.....33⅓&33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.....$2.00
Pike Mower Knife and Tool Grinder, each.....$6.00
33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

Guards, Snow—
Cleveland Wire Spring Co.:
Galv. Steel ₩ 1000.....$9.00
Copper ₩ 1000.....$18.00

Halters and Ties—
Covert Mfg. Co.:
Web.....45&2%
Jute Rope.....40&5&2%
Sisal Rope.....20&2%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....50&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties.....60&10%

Hammers—
Handled Hammers—
Heller's Machinists'..40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&10&10%
Peck, Stow & Wilcox.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.33⅓&7½@33⅓&10 & 7½%
Engineers' and B. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
3 lb. and under...lb. 45c
3 to 5 lb.....lb. 36c 75@5@75
Over 5 lb.....lb. 30c &10&5%
Wilkinson's Smiths'.....9½@10c lb.

Handles—
Agricultural Tool Handles—
Axe, Pick, &c......45@50&5%
Hoe, Rake, &c......60@60&5%
Fork, Shovel, Spade, &c.:
Long Handles.....60%
D Handles.....50%

Cross-Cut Saw Handles—
Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted.....*gro. $2.30@$2.50*
Brad Awl.....*gro. $1.25@$1.50*
Chisel Handles:
Apple Tanged Firmer, gro. ass'd, $2.25@$2.35; large, $2.50@$2.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.20; large, $3.50@$3.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25
Hickory Socket Firmer, gro. ass'd, $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted.....*gro. $1.60@$1.15*
Hammer, Hatchet, Axe, &c......50%
Hand Saw, Varnished, doz. 70@75c
Not Varnished.....55@60c
Plane Handles:
Jack, doz. 25c; Jack Bolted..55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₩ gro.....$0.85@$1.50

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch.....	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.85	1.30	1.50	1.90	2.30

Barn Door, New England Pattern, Check Back, Regular:

Inch.....	*3*	*4*	*5*	*6*
Single Doz.	$1.10	1.60	2.15	2.70

Allith Mfg. Co.
Reliable.....per doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$2.85
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&10&5%
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....50&10%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50&10%
Monarch Barn Door.....60&10%
Never Jump Hinge.....50&10%
Peerless.....60&10%
Perfection.....70&5%
Phœnix.....70&5%
Wagner's Adjustable.....70&10%
Warehouse Anti-Friction.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3.....$2.25
Imp'd Wood Track No. 5.....$2.25
Imp'd Steel Track No. 7.....$2.70
Imp'd Steel Track No. 7.....$2.65
Ball B'r'g Steel Track No. 9.....$2.50
Ball B'r'g Steel Track No. 10.....$2.50
Roller B'r'g Steel Track No. 11.....$2.45
Roller B'r'g Steel Track No. 12.....$2.40
Ball B'r'g Steel Track No. 13..$2.75
Roller B'r'g steel Track No. 14. $2 65
Ball B'r'g Trolley Track No. 15 ..40%
Ball Brg Trolley Track No. 19...40&5%
Ball Bearing Tandem Trolley Track No. 16.....40%
Silent Adjustable Track No. 18...40%
Auto Adjustable Track No. 22..40%
Trolley B. D. No. 17.....$1.60
Trolley F. D. No. 120.....$2.70
Trolley F. D. No. 121.....$2.85
Trolley F. D. No. 131.....$3.00
Roller Bearing D. D. No. 25.....70&5
Roller Bearing U. S. B. D.....70&5%
Anti Friction B. D.....60&10%
Ives' Wood Track No. 1.....$2.15
Ives' Imp'd Wood Track No. 2..$2.15
Stowell Mfg. and Foundry Co..
Acme Parlor Ball Bearing.....40%
Atlas.....60%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....60%
Lundy Parlor Door.....50%
Magic.....50%
Matchless.....60%
Nansen.....60&10%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....40&15%
Stowell Parlor Door.....50%
Wild West, Nos. 300, 404, 500.....50%
Zenith for Wood Track.....50%
A. L. Swett Iron Works:
Eagle.....60&10%
Hylo.....50&10%
Perfection.....60%
Pilot.....40%
Taylor & Boggis Fy Co's.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing....40%
Velvet.....50%
Wilcox Auditorium Ball Bearing.30%
Wilcox Barn Trolley No. 123. ....40%
WilcoxElv.Door, Nos 112and122½&.50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley. Roller Bearing.....30%
Wilcox Le Roy Nolseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing....40%
Wilcox Wideman Narrow Gauge. Ball Bearing.....40%
For Track, see *Rail*.
Extra 5&10% often given.

Hangers, Gate—
Myers' Patent Gate Hangers, ₩ doz., net, $4.50

Hasps—
McKinney's Perfect Hasp, ₩ doz.....50%

Hatchets—
Best Brands.....50@50&10%
Cheaper Brands.....60@60&10%
Note.—Net prices often made.

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O P Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.....	*1*	*3*	*5*
Doz. pair.....	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.....	*1*	*1½*	*2*	*2½*
Doz. pair....	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.....	*1*	*1½*	*2*
Doz. pair....	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13.....70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₩ doz. sets, without screws, $9.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S. Lull & Porter.....7 &5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Stenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55...70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3 & 5.....75%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 30 & 25.....70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10..75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.....	*1*	*2*	*3*
Hinges with Latches.	$2.00	2.70	5.00
Hinges only.....	$1.40	2.05	3.80
Latches only.....	.70	.70	.85

New England:
With Latch.....doz. ....@$2.50
Without Latch.....doz. ....@$1.80
Reversible Self-Closing:
With Latch.....doz. ....@$1.80
Without Latch.....doz. ....@$1.45
Western:
With Latch.....doz. $1.80
Without Latch.....doz. $1.30
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches...	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	1.35

Spring Hinges—
Holdback, Cast Iron....gro. $9.00
Non-Holdback, Cast Iron...gro. $8.60
Extra 5&10% often given.

J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....45%
Garden City Engine House.. . 25%
Keene's Saloon Door.....25%
Columbian Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20&5%
American.....30%
Columbia, No. 14.....₩ gr. $9.00
Columbia, No. 18.....₩ gr. $25.00
Columbia, Adjustable, No. 7. ₩ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₩ gr. $12.50
Oxford, new list.....30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable 10.50
Lawson Mfg. Co.:
Matchless.....35%
Matchless Pivot.....45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge.45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₩ gr $12.50
Ideal, No. 4.....₩ gr. $9.00
New Idea No. 1.....₩ gr. $9.00
New Idea, Double Acting.....45%
Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges.....80@*
Heavy Strap Hinges 80@20@10%
Light T Hinges.....75@10@5%
Heavy T Hinges... 75@5%
Extra Heavy T Hinges ..80@2½%
Hinge Hasps.....70%
Cor. Heavy Strap....80@20@10%
Cor. Ex. Heavy T.....80@20%
Ex 10@10& 1%
Screw Hook and Strap. { *6 to 12 in*..... *lb.* 3½c; *1½ to 20 in*..... *lb.* 3½c; *22 to 36 in*..... *lb.* 3 c
Screw Hook and Eye:
¾ to 1 inch.....*lb.* 6 c
⅝-inch.....*lb.* 7 c
½-inch.....*lb.* 9 c

Miscellaneous—
Hoffman's Steel Spring Butt Hinges....40&10%
Hoffman's Offset Refrigerator Hinges..40&10%

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers.....35%

Hods, Coal—

	15	*16*	*17*	*18 inch.*
Galv. Open..	$2.50	2.75	3.00	3.25 ₩ doz.
Jap. Open...	$2.00	2.25	2.50	2.75 ₩ doz.
Galv. Fun'el.	$3.00	3.25	3.50	3.75 ₩ doz.
Jap. Funnel.	$2.50	2.75	3.00	3.25 ₩ doz.

Masons, Etc.—
Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10
Hoffman's:
Brick.....each $1.10
Masons'.....each $1.00
Plasterers'.....each $3.20

Hoes— Eye—
Scovil and Oval Pattern.....60@10@60@10@10%
Grub, list Feb. 23, 1899.....60@10@60@10@5%

Handled—
Aug. 1, 1899, List:
Garden.....70@10%
*Meadow & Rhode Island*75@2½%
Southern Meadow...75@5@2½%
Mortar and Street.....75@7½%
*Planters', Regular Pat'n.*70&30%
Cotton.....75@7½%
*Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco.*70@10@5%
Extra 20%

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Cotton Hoe.....75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₩ doz. $5.00
Junior Size.....₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz. $4.00
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10&2%
Acme Weeding.....75&10&2%
W. & C. Lightning Shuffle Hoe, ₩ doz. $5.85

Hoisting Apparatus—
See *Machines, Hoisting*.

Holders— Bit—
Angular, ₩ doz. $24.00.....45&10%

Door—
Empire.....30%

File and Tool—
Nicholson File Holders and File Handles.....38½%

Hooks— Cast Iron—
Bird Cage, Reading.....60%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....40&10%
Clothes Line, Hoffman's.....40&10%
Clothes Line, Reading List 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List.....45&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Wrightsville.....65%
Harness, Hoffman.....per doz. 35@40¢
Harness, Reading List.....70&10@75%

Wire—
Belt.....80@80&5%
Wire C. & H. Hooks.....70@70@5%
Atlas, Coat and Hat:
Single Cases.....50%
10 Case Lots.....50&10%
Czar Harness.....50&10&5%

Wire Coat and Hat:
Acme....60%
B. B....60%
V Brace, Chief and Czar....60%
Gem....60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton....doz. $1.05@1.25
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best.... $1.50 1.75 2.00
Common.. $1.30 1.50 1.70 1.60
Potato and Manure....66⅔&20%
Whiffletree....lb. 5½@6c
Hooks and Eyes:
Brass....60c&10c&10@70%
Malleable Iron....70c&5@70c&10%
Covert Saddlery Works' Self Locking Gate and Door Hook....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Crown Picture....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition....ft. 4¼@ 4¾c
3-ply Standard....ft. 6 @ 6½c
4-ply Standard....ft. 7½@ 8 c
3-ply extra....ft. 8½@ 9 c
4-ply extra....ft. 10½@11 c
Cotton Garden, ¾-in., coupled:
Low Grade....ft. 6 @7 c
Fair quality....ft. 8 @9 c

Irons— Sad—

From 4 to 10....lb 3@3¼c
B. B. Sad Irons....lb. 3@3¼c
Chinese Laundry....lb. 4¼@5c
Chinese Sad....lb. 3¾@4c
Mrs. Potts', per set:

Nos.	50	55	60	65
Jap'd Tops	71c	71c	81c	81c
Tin'd Tops	77c	74c	87c	84c

New England Pressing, lb.. 3½@3¾c

Pinking—

Pinking Irons.. ....doz. 50@60c

Soldering—

Soldering Coppers 2¼ and 3.. 22@23
1¼ and 2....24@25
Covert Mfg. Co....20&2%

Jacks, Wagon—

Covert Mfg. Co.
Auto Screw....30&5%
Steel....45&2%
Covert's Saddlery Works':
Daisy....60&10%
Victor....60&10%
Lockport....50%
Lane's Steel....35&10%

Kettles—

Brass, Spun, Plain....30@35c
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c....30%
Hartzell Cutlery Co....50%
Smith & Hemenway Co....10&10%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₱ doz., $2.05; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.10.

Drawing—

Standard Last....70&5@70c&10%
Bradley's....
C. E. Jennings & Co. Nos. 45, 48....60&10%
Jennings & Griffin, Nos. 51, 60....60&10&10%
Swan's....70&10&2½%
Watrous....10%&10%
L. & I. J. White....20&5@25%

Hay and Straw—

Lightning....₱ doz. $6.50@7.00
Iwan's Sickle Edge....₱ doz. $10.00
Iwan's Serrated....₱ doz. $10.00
Maine....₱ doz. $8.50

Mincing—

Buffalo....₱ gro. $13.00

Miscellaneous—

Farriers'....doz. $2.00@3.00
Wostenholm's....₱ dos. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro....$1.05@1.10
Carriage, Jap. all sizes..gro. 25@30c
Door, Mineral....doz. 65@70c
Door, Por. Jap'd....doz. 70@75c
Door, Por. Nickel....doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c..15%
Picture, Sargent's....60&10%

Lacing Leather—

See *Belting Leather—*

Ladders Step Etc.—

Lane's Store....25%
Myers Noiseless Store Ladders....50%

Ladles— Melting—

L. & G. Mfg. Co....25%
P. S. & W....50%
Reading....60%
Sargent's....45&10%

Lanterns— Tubular—

Regular Tubular No. 0, doz. $4.35@4.75
Lift Tubular..No. 0..doz. $4.75@5.25
Hinge Tubular, No. 0..doz. $4.75@5.25
Other Styles....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾ inch....$2.50@2.75
No. 2, 3 inch....$2.75@3.00

Latches— Gate—

Hoffman's Safety Gate....₱ doz. 60c

Thumb—

Roggin's Latches, with screw, dz 35@40c

Leaders, Cattle—

Small....doz. 55c; large, 60c
Covert Mfg. Co....45&2%

Lifters, Transom—

R. & E....33⅓%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.50*

Ossawan Mills.
Crown Solid Braided Chalk....33⅓%
Mason's, No. 0 to No. 5....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 8....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr....30%
Anniston Waterproof Clothes, 50 ft., ₱ gro.: $24.00; Gilt Edge, $22.00; Air Line, $23.00; Acme, $17.00; Alabama, $16.00; Empire, $17.00; Advance, $14.00; Alliston, $13.00; Calhoun, $11.00; Oriole, $20.00; Albermarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $9.00.

Locks— Cabinet—

Cabinet Locks....33⅓&33⅓&7½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co....50%
R. & E. Mfg. Co....40%
Sargent & Co....40@40&10%

Elevator—

Stowell's....40%

Padlocks—

Wrought Iron....75c&10c&5@80c&5%
R. & E. Mfg. Co. Wrt. Steel and Brass....75@75&10%

Sash, &c.—

Ives' Patent.:
Bronze and Brass....55&7½%
Crescent....50%
Iron....60&2½%
Wrought Bronze and Brass....50&5%
Wrought Steel....55%
Reading....60c&10&10@70%

Machines— Boring—

Com., Upright, Without Augers..$2.00
Com., Angular, Without Augers..$2.25

Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3	$4.25	No. 1 $5.00
Improved No. 4	3.75	No. 2 3.38
Improved No. 5	2.75	
Jennings'	No. 4, 3.15	No. 1, 3.50
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Hoisting—

Moore's Anti-Friction Differential Pulley Block....30%
Moore's Hand Hoist, with Lock Brake..20%
Moore's Portable Pneumatic Hoist....25%

Ice Cutting—

Chandler's....15&10%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary	$57.00
Boss No. 7; Dietz Rotary	60.00
Champion Rotary; Banner No. 1	54.00
Standard Champion No. 1	48.00
Standard Perfection	36.00
Cinti Square Western	30.00
Uneeda American, Round	29.00

Mallets—

Hickory....45&25@50%
Lignumvitæ....45c&5@50%
Tinners', Hickory and Applewood, doz....90@95c

Mats— Door—

Elastic Steel (W. C. Co.)....10%

Mattocks—

See *Picks and Mattocks.*

Menders Hose

Robinson's Hose Menders....₱ gro, $2.00

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—

Enterprise Mfg. Co....25@30%
Hoffman's Side, Coffee and Spice....₱ doz. $1.25
National, list Jan. 1, '04....30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side....50&10@60%
Sun. No. 1080, 1 lb mill....₱ doz. $8.00
Swift, Lane Bros Co....30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap....all sizes. $1.90@1.95
Good....all sizes, $2.25@2.50

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental....60&5%
Great American....70%
Great American Ball Bearing, new list..70%
Quaker City....70%
Pennsylvania....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf....50%
Pennsylvania Horse....40%
Pennsylvania Pony....45%
Philadelphia:
Styles M., S., C., K., T....70&10%
Style A, all Steel....60&10%
Style E, High Wheel....70&10&5%
Drexel and Gold Coin, low list..50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899....85@85&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	28¢	25¢	24¢	23¢	50&10%
C. B. K.	25¢	25¢	22¢	21¢	21¢	40%
Champion	28¢	26¢	25¢	24¢	23¢	40&10&5%
Button	19¢	17¢	16¢	15¢	14¢	30&10&5%
Maud S.	25¢	23¢	22¢	21¢	21¢	50%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓%

Putnam
Cold Rol'd 19¢ 18¢ 17¢ 16¢....10&10%
American, Nos. 5 to 10 ₱ lb....9@9½¢
Nonouset....Nos. 5 to 10¢ ₱ lb 12¢
Jobbers' special brands...per lb. 8@9c

Picture

	1½	*2*	*2½*	*3*	*3½ in.*
Brass Head.	*.45*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head....		*1.10*	*1.10*	*1.10*	*.. gro.*

Crown Picture Nails....₱ gro. $1.50

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: Mfrs. or U. S. Standard. Off list.
Square, plain....$4.50
Hexagon, plain....$4.60
Square, C. T. & R....$4.70
Hexagon, C. T. & R....$5.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank....$4.80@5.00
Hexagon Blank....$5.00@5.50
Square Tapped....$4.60@4.80
Hexagon Tapped....$4.80@5.10

Oakum—

Best or Government....lb. 6¼c
Navy....lb. 4¾c
U. S. Navy....lb. 5¾c
Plumbers' Spun Oakum....2¾c
In carload lots ¼c lb. off f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper....65@65c&10%
Tin or Steel....70c&10@75%
Zinc....75@75c&10%
Chase or Paragon:
Brass and Copper....45c&10@50%
Tin or Steel....75@75c&10%
Zinc....66@60c&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans....70@70&10%
Railroad Oilers etc....60@60&10%

Openers— Can—

French....doz. 35c
Iron Handle....doz. 25@27c
Sprague, Iron Hdle..per doz. 35@40c
Sardine Scissors...doz. $1.75@3.00
Marvel....per doz. $1.25
National....50%
Stowell's....per doz. 35@45¢
Tip Top....per doz. $0.75

Egg—

Nickel Plate....per doz., $2.25
Silver Plate....per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—

Sheet, C. I....8@12c
Sheet, C. O. S....9@13c
Sheet, C. B. S....10@14c
Sheet, Pure Gum....50@70c
Sheet, Red....35@40c
Jenkins' Standard, ₱ lb 80¢....25@25&5%

Miscellaneous—

American Packing....7@10c lb.
Cotton Packing....14@16c lb.
Italian Packing....9@12½c lb.
Jute....4c lb.
Russia Packing....7@11c lb.

Pails— Creamery

S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

Galvanized—

Price per doz.

Quart....	*10*	*12*	*14*
Water, Regular..	*1.50*	*1.75*	*2.00*
Water, Heavy....	*2.75*	*3.00*	*3.25*
Fire, Rd. Bottom.	*2.30*	*2.60*	*2.80*
Well....	*2.25*	*2.50*	*2.75*

Pans— Dripping—

Standard List....60c&5@60&10%

Fry—

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.95*	*1.05*	*1.15*	*1.30*	*1.65*

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Simplex, ₱ doz.:

No.	40	50	60	140	150	160
	$2.75	3.25	3.75	3.00	3.25	4.00

Paper—Building Paper—

Asbestos: *lb.*
Building Felt....2¾c
Mill Board, sheet, 40 x 40 inches 3½c
Mill Board, roll, thicker than 1-16 inch....3¼c
Mill Board, roll, 1-16 in. thick and less....2½c

Per roll

Rosin Sized Sheathing: 500 sq. ft.
Light wt., 25 lbs. to roll..$0.45@0.50
Medium wt., 30 lbs. to roll..$0.48@0.55
Heavy wt., 40 lbs. to roll..$0.68@0.75
Black Water Proof Sheathing, 500 Sq. ft, 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.35.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton....$45.00
Red Rope Roofing, 250 sq. feet per roll....$1.65
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 200 sq. ft.), ton..$35.50@37.00
2 ply, roll 108 sq. ft....60@65c
3 ply, roll 108 sq. ft....85@90c
Slater's Felt (roll 500 sq. ft.)....75c
NOTE.—*Above prices often include delivery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.)....$2.75

Sand and Emery—

Flint....60@60c&10%
Garnet....25@30@15%

Parers— Apple—

Advance	₱ doz. $4.50
Baldwin	₱ doz. 5.00
Bonanza Improved	each 90.50
Dandy	each 2.50
Eureka Improved	each 2.00
Family Bay State	₱ doz. 3.00
Improved Bay State	₱ doz. 3.00
New Lightning	₱ doz. 2.50
Reading 72	₱ doz. 4.00
Reading 78	₱ doz. 2.00
Turn Table '98	₱ doz. 60.75
White Mountain	₱ doz. 25.00

Potato—

Saratoga....₱ doz. $7.00
White Mountain....₱ doz. 10.00

Picks and Mattocks—

List Feb. 23, 1899...60&10@65&10%

Pinking Irons—

See *Irons, Pinking.*

Pins— Escutcheon—

Brass....60@60&10%
Iron, list Nov. 11, '85....80@80&10%

Pipe, Cast Iron Soil—

Standard, 2-6 in....50&10%
Extra Heavy, 2-6 in....65%
Fittings....70%

Pipe, Merchant,

Steel or Iron, Carload Lots,

	f.o.b. Pittsburgh.	*Galvanized.*
Merchant Pipe.	*Black.*	
⅛, ¼, ⅜ inch	*68%*	*58%*
½ inch	*70%*	*60%*
¾ to 6 inch	*75%*	*65%*
7 to 12 inch	*69%*	*59%*

Less than carloads, 12½% advance

Pipe Sewer—

Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England....70%
New York and New Jersey....73%
Maryland, Delaware, East Penn....75%
West Penn and West Va....76%
Virginia....78%
Ohio, Michigan and Ky....78%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.50	$8.50
6 in., per 100 joints	8.00	9.00
7 in., per 100 joints	9.00	10.00

Planes and Plane Irons—

Wood Planes—

Bench, First quality....40c&5@40c&10%
Bench, Second qual....50c&5@50c&10%
Molding....33⅓&5@33⅓c&10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality....40@40&10%
Bench, Second Quality....50@50&10%
Molding....33⅓@33⅓&10%
Toy and German....40@40&10%
Gage Self Setting....35%
Union....60%

Iron Planes—

Bailey's (Stanley R. & L. Co)....25&10@25&10&10%
Chaplin's Iron Planes....50&10%
Miscellaneous Planes (Stanley R. & L. Co.)....20&10@20&10&10%
Sargent's....60%
Union....60%

Plane Irons—

Wood Bench Plane Irons....30c&5@30c&10%
Buck Bros....30%
Chapin-Stephens Co....30@30&10%
Stanley R. & L. Co...20&10@20&10&10%
L. & I. J. White....20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse....₱ doz. $8.50

Plates—

Fellge....lb. 3¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00....50%

Pliers and Nippers—

Button Pliers....75@75c&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$1.75	*$2.00*	*$2.75*	*$3.75*

Acme Nippers....50@50&5%
Bernard's:
Parallel, Pliers....35%
Paragon Pliers....50&5%
Lodi Pliers....50&5%
Elm City Fence Pliers....35%
Cronk & Carrier Mfg. Co.:
American Button....75&10%
Cronk's....10%
Improved Button....70&10%
Stub's Pattern....50%
Combination and others....35%
Heller's Farriers' Nippers, Pincers and Tools 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers....30@30&10%
Swedish Side, End and Diagonal Cutting Pliers....
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....30%

Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels....30@30&10%
Chapin's Imp. Brass Cor....40@40&10%
Pocket Levels....30@30&10%
Level Glasses....60@60&10%
Disston's Plumbs and Levels....
Disston's Pocket Levels....
C. E. Jennings & Co.'s Iron....25%
C. E. Jennings & Co.'s Iron, Adjustable....33⅓%
Stanley R. & L. Co...30&10@30&10%

Stanley's Duplex.....20@20&10&10%
Wood's Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $4.50; No. 2, $ .00; No. 3, $ .00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 8¼c@..
¼-lb. papers..... lb. 9¼c@..
¼-lb. papers..... lb. 9½c@..

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman's:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ lb cans. ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt. Square.....gro. $9.00
1 qt. Round.....gro. $10.00
1½ qt. Square.....gro. 11.00
2 qt., Square.....gro. 13.00

Post Hole and Tree Augers and Diggers—

see also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6 4½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun	Rifle
Keg (25 lb bulk).....	$12 00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17 00
Half case 12 (1 lb cans blk)	7.25	8 75

Robin Hood Shot Gun.....50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50.....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $12.00..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $37.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $5.50; No. 2 (large), $5.25; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4.50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Alex.....60%
Diamond B, No. 2, case lots. ₱ doz $6.00
Diamond B, No. 2, case lots. ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $15.50; No. 3, $15.....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch.....	2	2¼	3
Awning..doz	$0.55	.85	1.15

Hay Fork, Swivel or Solid Eye.....doz., 4 in., $1.15; 5 in., $1.50

Inch	2	2¼	2½
Bot House..doz	$0.70	.90	1.25
Inch	1¼	1½	1¾ 2
Brace.....doz	$0.16	.19	.23 .30
Inch	1¼	2	2¼ 2½
Side.....doz	$0 30	.40	.55 .63
Inch.....	1½	1¾	2 2½
Tackle....doz	$0.30	.42	.53 1.00

Snow Ill's:
Ceiling or End, Anti-Friction.....60%
Double Wafer, Anti-Friction...60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00.....50%
Electric Light.....60%
Stee , Anti-Friction.....0&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ in., 18c; 2 in., 19c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 25¢
Grand Rapids All Steel Noiseless....50%
Ideal No. 13.....1¾ in., ₱ doz.. 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in.. 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....75 & 10@80%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	3	3¼	3½	3¾ 4
	$3.30	*3.60*	*3.85*	*4.10 4.40*

Barnes Dbl. Acting (low list)..... 50%
Contractors' Rubber Diaphragm No. 2 R. & L. Block Co.....$18.00
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $3.75@4.00
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A, B, C), ₱ doz., $15.00 .50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal. ₱ doz.. $15.00.....50%
Bench Punch, each, $30.00 .....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.
$1.70	*$2.10*	*$3 00 100 feet.*

Angular for Sq. Groove Wheels:

Small	*Med.*	*Large.*	
$1.00	*1 95*	*2.70*	*100 feet.*

Sliding Door, Brnzed Wr't Iron, ft. 6½c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1⅛ in.....lb. 36c...30%
Allith Mfg. Co. Reliable Hanger Track ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $3.90; 1½ inch, $4.85.
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.' ₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....30%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard .....₱ ft. 4 c
Myers' Stayon Track .....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special .....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel 30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail .....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain....3½¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

10	*12*	*14*	*16-tooth*
Shank.....$1.50	*1.60*	*1.75*	*1.85*
Socket.....$1.65	*1.80*	*1.95*	*2.10*

Steel, August 1, 1899, List...70&5&20%
Malleable.....70@10@75&5%
Lawn Rakes, Metal Head, per doz., 20 teeth.....*$3.25@3.50*
24 teeth.....*$3.60@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn $3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3 45
Lawn Queen, 24-tooth, ₱ doz $3.60
Paragon, 20 tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.. .....$2.98
Malleable Garden, 14-tooth, ₱ doz...$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5&10&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10%
see also *Files.*

Razors—

Borasic.....60 & 10%
Fox Razors, No. 42, .. ₱ doz. $20.00 } 40%
Fox Razors, No. 44, .. ₱ doz. $20.00 } dis.
Fox Razors, No. 82, Platina, ₱ doz. } –25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$ 8.00
Griffon, No. 65.....$15.00
Griffon, No. 99.....$12.00
All other Razors.....40%
Safety Razors.....40%

Safety Razors—

New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades .....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.) ..... ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30 00
Hendryx:
M 6, Q 6, A 6, B 6, M 9½ 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3 04 N, 6 N, 4 N to 8 PN.....33⅓%
6 RW, 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN.....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PRN.....50&5%
2304 N.....40&10&5%
5009 P and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0924 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....0&10%
Competitor, 304 and 304 PN 35%
00304 P and PN.....40&5%
Safety an I Salmon.....30%

Registers—*List July 1, 1903.*

Black Jap.....
White Jap.....
Bronzed.....
Nickel Plated.....
Electro Plated.....
70@75 & 10%

Registers, Cash—

Sun, No. 1, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....85@90c
Double Act n, except 44 cal..$1.50@1.60
Double Action, 44 caliber...$1.75@1.95
Automatic.....*$2.25@3.50*
Hammerless.....*$3.75@4.10*

Riddles, Hardware Grade

16 in., per doz.....*$2.25@$2.50*
17 in., per doz.....*$2.50@$2.75*
18 in., per doz.....*$2.75@$3.00*

Rings and Ringers—

Bull Rings—

2	*2½*	*3 Inch.*
Steel.....$0 70	*0.75*	*0.80 doz.*
Copper..... *1.00*	*1.10*	*1.35 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron. doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers..per doz. $0.75@1.00

Rivets and Burrs—

Copper.....50&10@50&10&5%
Iron or Steel:
Tinners'.....75@75&10%
Miscellaneous.....75@75&10%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay.....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger, tarred or untarred...lb. 11½@12 c
Manila, ⅜-inch .. lb. 12 @12¼c
Manila, ¼ & 5-16 in....lb. 12½@13 c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse.....lb. 11½@12 c
Sisal, 7-16 in. and larger lb. 8¾@ 9¼c
Sisal, ⅜-inch .. lb. 8¾@10 c
Sisal, ¼ and 5-16 inch..lb. 9¼@10 c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse.....lb. 8¾@10 c
Sisal, Tarred, Medium Lath Yarn.....lb. 8¾@ 9½c
Cotton Rope:
Best.....¼-in. and larger, lb. 16 c
Medium..¼-in. and larger, lb. 14 c
Com ¼-in. and larger, lb. 10 c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Yarn, ¼-in. and up.....lb. 5½c
Old Colony Manila Transmission Rope, ₱ lb 17½¢

Wire Rope—

Galvanized.....40&5%
Plain.....45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....30%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....60&10@60&10&5%
Ivory.....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35%35&10&10%
Miscellaneous.....50@50&10&10%
Combination.....55@55%10%
Stationers'.....10@10@10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage*

Saw Frames—See *Frames, Saw*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames 20@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....25%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in wide.....60%
Band, ¼ to 2½.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keyhole, &c.....25%
Butcher Saws and Blades.....30%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws..35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&25&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....35&5&7½%
Butcher Saws.....35&5&7½%
Hand Saws.....25&25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Keyhole, &c .....25&25&7½%
Wood Saws.....35@35&7½%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 30%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....20%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $3 00
Covert's Saddlery Works .....60&10%

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch, Platform, ½ oz to 4 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list) .. 25&35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing 50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....*doz. $2.25@2.50*
Box, 2 Handle.....*doz. $3.00@3.50*
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens ..... 60&5@60&5&2½%
Hummer Window Screens ..... 60&5@60&5&2½%
Klondike Window Screens..... 60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in.. $2.75@3.00 :
1¼, $3.25@3.50; 1¼, $3.85@4.25
Bench, Wood, Beech..doz. $3.00@3.50
Hand, Wood.....50@50&5%
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....80&10&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....70&15@...%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....70&10@...%
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&10%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel).....70%
Sq. Hd. Cap.......65%*
Hex. Hd, Cap.....65%
Rd. or Fillister Hd. Cap.....60%

Wood—

List July 23, 1903.
Manufacturers' printed discounts :
Flat Head, iron.....87½&10@...%
Round Head, Iron.....85&10@...%
Flat Head, Brass.....85&10@...%
Round Head, Brass...80&10@...%
Flat Head, Bronze....77½&10@...%
Round Head, Bronze.....75&10@...%
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes— Per doz.

Clipper Pattern, Grass...$4.50@$5.00
Full Polished Clipper.....$5.0@$6.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.75@$5.00

Seeders— Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....9%&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18.....15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&30&10&10%

Garden Tool Sets—

Ft. Madison, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted.....gro. $1.80@2.50
Octagon.....gro. $4.00@4.25
Knurled, Good.....gro. $5.75@6.00
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70&10@7½%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut.....₱ doz. $9.00
Royal Hand.....₱ doz. $5.40
Taintor Positive, ₱ doz. $18.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

Shaves Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.65@2.25
Bailey's (Stanley R. & L. Co.).....50&50&10&10%
Chapin-Stephens Co.....50&50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

	7	*8*	*9 in.*
Cast Iron...			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$7.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....1900 list 45%
Wilkinson's Pruning.....40%
Wilkinson's Sheep.....1900 list. 25%

Tinners' Snips—

Steel Blades.....20&5@20&10
Steel Laid Blades.....40&10@5%
Forged Handles, Steel Blades, Berlin.....40&40&10%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch.....40&7½&10%
Niagara Snips.....40%
P., S. & W. Co.....20%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz. $12.00.....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades...40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list.....70&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....50%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells— Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.....65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 15 and 20 gauge.....30%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder.....40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood, Low Brass.....50%
Robin Hood, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.40
Drop, B and larger, per 25-lb. bag $1.65
Buck, 25-lb. bag.....$1.65
Chilled, 25-lb. bag.....$1.65
Dust Shot, 25-lb. bag.....$2.00

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11.00
Shaker (Barler's Pat.) Flour Sifters. ₱ doz., $2.00.....30%

Sievos, Tin Rim—

Per dozen

Mesh	*1½*	*16*	*18*	*20*
Black, full size	*$1.20*	*1.25*	*1.30*	*1.45*
Plated, full size	*$1.30*	*1.45*	*1.50*	*1.55*
Black, scant	*....*	*$0.75*	*1.00*	*1.05*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.65@0.75
Mesh 20, Nested, doz.....75@.85
Mesh 24, Nested, doz.....90@1.00

Sinks—

Cast Iron—
Standard list.....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins Wagon—

Cast Iron.....70@70&10%
Malleable Iron.....40&10@50%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....45%
Noiseless Slates.....60&4 less 5%
Wire Bound.....40%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No, 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Leroy.....20&5&2½
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community :
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded.....60½&10%

Snaths—

Scythe.....45&5@50&12½%

Snips, Tinners'—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&10&5%
Cheap.....50@50&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60@60&10%
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1..&10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables.....per gro. 90c@$1.00

Springs— Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ⅛ Bright, lb.....4¾@5c
Bright, lb.....5¼@5½c
Painted Seat Springs :
1¼ x 2 x 26, per pr.....50@55c
1¼ x 2 x 28 per pr.....60@65c
1¼ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@30%
Macksey.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } *List Jan. 5, 1900.*
Steel and Iron... } *70&10@70&10&10%*
Rosewood Hdl Try Square and T-Bevels.....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels. 50&10@50&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter.....40&10&40&10&10%

Squeezers— Lemon—

Wood, Common, gro.. No. 0, $5.25 @$5.50 : No. 1, $6.25@$6.50.
Wood, Porcelain Lined.
Cheap.....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2.00@3.25

Staples—

Barbed Blind.....lb. 6@6½c
Electricians', Association list.....80&10&10&10%
Fence Staples, See Trade Report.
Galvanized, 10c less than Barb Wire
Polished, 20c less than Barb Wire.
Poultry Netting, Staples....per lb. 2½@2½c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....30&5%
C. & A. Hoffmann's.....40%

Steelyards.....25&5@30&10%

Stocks and Dies—

Blacksmiths'.....10&10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25&30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $3.00 per gro., 12 inch, $10.50
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S. ₱ gro. $7.00
No. 2 Indian Pond S. S. ₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....35%
Gem Corundum Slips.....35%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

	₱
Arkansas Stone, No. 1, 3 to 5½ in.	$2.50
Arkansas Stone, No. 1, 5½ to 8 in.	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita 4 to 8 in	.60¢
Rosy Red Washita, 4 to 8 in	.60¢
Washita Stone, Extra, 4 to 8 in	.50¢
Washita Stone, No. 1, 4 to 8 in	.40¢
Washita Stone, No. 2, 4 to 8 in	.30¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢

India Oil Stones (entire list).....33⅓%
Hindostan No. 1, Regular.....₱ lb.
Hindostan No. 1 Small.....₱ lb.
Axe Stones (all kinds).....
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb.
Queer Creek Stones, 4 to 8 in.....
Queer Creek Slips.....
Sand Stone.....
Belgian, German and Swaty Razor Hones.....
Natural Grit Carving Knife Hones, ₱ doz.....
Quick Edge Pocket Knife Hones, ₱ doz.....
Mounted Kitchen Sand Stone, ₱ doz.....

Stoners— Cherry—

Enterprise.....25&10%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....
Morrill's, No. 2, $12.50.....

Door—

Chapin-Stephens Co.....60&10&10%

Plane—

Chapin-Stephens Co.....

Straps— Box—

Cary's Universal, case lots.....20&10%

Hame—

Covert's Saddlery Works.....

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60c
Socket.....doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '07.....30%

Supports, Porch—

Hoffman's Porch Supports....₱ doz. 25c

Sweepers, Carpet—

National Sweeper Co.: Per doz
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel.....$27.00
Monarch, Roller Bearing, Nickel.....$22.00
Monarch, Roller Bearing, Japanned.....$20.00
Marion Queen, Roller Bearing, Regular Finishes, full Nickel.....$24.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$33.00
Perpetual, Regular Bearings, Nickel.$30.00
Perpetual, Regular Bearings, Jap.$18.00
NOTE.—*Discount of 30c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American.....90&25&5@....%
American Cut Tacks 90&20&5@....%
Swedes Iron Tacks...90&30&5@....%
Swedes Upholsterers' Tacks.....90&45&10&5@....%
Gimp Tacks.....90&45&5@....%
Lace Tacks.....90&40@....%
Trimmers' Tacks..90&30&10&5@....%
Looking Glass Tacks....70&10@....%
Bill Posters' and Railroad Tack....90&45&5@....%
Hungarian Nails....80&20&5@....%
Common and Patent Brads....80&10%
Trunk and Clout Nails...60&5@....%
NOTE.—*The above prices are for "Straight Weights." An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and 5 tens
Steel Wire Brads, R. & E. Mfg. Co's list.....50&10&5%

See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.	30-gal $3.40
Emerald, S. S. & Co.	60-gal. $4.25
Queen City S. S. & Co.,	35-gal $3.05
Queen City S. S. & Co.,	60-gal $4.50

Tapes, Measuring—

American Asses' Skin.....40&10@5%
Patent Leather.....25@30&5%
Steel.....40@40&5%
Chesterman's.....25&10&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓&5%
Lufkin's Metallic.....30&10&5%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ¾ inch and larger, per 100 lbs. $2.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire.

Single Loop.....80&5%
Monitor, Cross Head, Etc.....50%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₱ 1000 $10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000 $11.00
Galv. Steel 5-32 x 11¼ in. ₱ 1000 $11.00
Galv. Steel 5-32 x 15¼ in. ₱ 1000 $11.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools—Coopers'—
L. & L. J. White ..... 20@20&5%

Hay—
Myers' Hay Tools 30%

Saw—
Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 35%

Ship—
L. & L. J. White 25%

Transom Lifters—
See Lifters, Transom.

Traps—Fly—
Bullson, Globe or Acme ..... doz. $1.15@1.25 ; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.25@1.50 ; gro. $13.00@13.50

Game—
Oneida Pattern ..... 30@30d5%
Newhouse ..... 45@45&5%
Hawley & Norton ..... 65&5@65&10%
Victor (Oneida Pattern) ..... 75@75&5%
Star (Blake Pattern) ..... 60@5@60&10%

Mouse and Rat—
Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat. Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $4.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Scnuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 ..... 50%

J. M Mast Mfg. Co.:

	Per gro. Mouse.	Rat.
Blizzard	No. 12, $3.00	No. 1, $9 50
Old Nick	No. 30, 2.22	No. 2, 8.40
Joker	No. 5, 2.10	No. 3, 8.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2.40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—
Bonney's Nos. 1 and 2 ..... 40%
Wood's K I 50%

Trowels—
Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ..... ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in ..... ₱ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Peace's Plastering 30%
Rose Brick and Plastering ..... 25&5%
Woodrough&McParlin,Plast'ring 25%

Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$4.75*	*5.25*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5.25	6.00	6.75	6.50	7.00	8.00

Twine—Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	21½c	23½c
No. 12, ¼ and ½ lb. balls	17½c	19½c
No. 18, ¼ and ½-lb. Balls	15½c	17½c
No. 24, ¼ and ½-lb. Balls	15 c	17 c
No. 36, ¼ and ½-lb. Balls	14½c	16½c

Chalk Line, Cotton, ½-lb Balls ..... 28@30c
Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 9@10c
Cotton Wrapping 5 Balls to lb ... according to quality. ..12 c@23c
American 3-Ply Hemp, ¼ and ½-lb. Balls ..... 13@14c
American 3 Ply Hemp, 1-lb. Balls .. 13@14c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 8c
India 3-Ply Hemp, 1-lb. Balls 8c
India 3-Ply Hemp, 1½-lb. Balls 7c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls ... 8@10c
Mason Line, Linen, ½-lb. Balls 45c
No. 264 Mattress, ¼ and ½-lb. Balls 37c
Wool, 3 to 6 ply ..... 5½@6c

Vises—
Solid Box ..... 50&10@50&10d5

Parallel—
Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 40%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00 net
Pattern Makers' No. 2 ..... $13.00 net
Machinist and Tool Makers' ..... $15.00 net
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' 40%
Keystone ..... 65&5%
Lewis Tool Co ..... 20@30%
Merrill's 20%
Miller's Falls ..... 50&10&10%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L 33⅓%
Stephens' 33⅓%

Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 . 50&5%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00 ; 9 in., $7.00 ; 14 in., $8.00.

Miscellaneous—
Bignall & Keeler Combination Pipe Vise 60%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	60c
B. E., 9 and 10	70c
B. E., 8	80c
B. E., 7	80c
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B E., 11 and larger	$1.70@1.75
Ely's P. E., 12 to 20	$3.00@ 3c

Dis. 15%

Ware, Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Ground ..... 50@10@60%
Unground ..... 60@5@65%
White Enameled Ware:
Maslin Kettles 70%
Covered Ware:
Tinned and Turned 50%
Enameled 50%
See also *Pots Glue.*

Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01 ..... 50&10%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettle—
Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.
Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 45&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles 60%

Warmers, Foot—
Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—
Solid Zinc: ₱ doz
Crescent, family size, bent frame $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.90
Single Zinc Surface:
Naiad, family size, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.25
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid ..... 80d10@80d10d10%
Patent ..... 90@90d5%
Coil: ⅞ 1 1¼ 1¼ Inch.
11c 12c 13c 14c per box

Iron or Steel

Size bolt	*5-16*	⅜	½	⅝	¾
Washers	*$6.80*	*5.40*	*4.60*	*4.10*	*4.20*

In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.

Cast Washers—
Over ½ inch, barrel lots, per lb. ..... 1¾@2c

Waterers, Hog—
Improved Dewey. ₱ doz $26.00 ..... 50%

Wedges—
Oil Finish ..... lb. 2.90@3.10c

Weights—
Hitching—
Covert's Saddlery Works ..... 60&10%

Sash—
Per ton, f.o.b. factory:
Eastern District $26.00
Western, Central and Southern Districts $27.00

Wheels, Well—
8-in., $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.50@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—
Bright and Annealed:
6 to 9 ..... 72½d5@72½d&10%
10 to 18 ..... 72½d10@72½d10d5%
19 to 26 ..... 75d10@75d10d7½%
27 to 36 ..... 75d10d7½@80d2½%
Galvanized:
6 to 18 ..... 70@70d5%
19 to 26 ..... 72½d5@72½d10%
27 to 36 ..... 72½d10@72½d10d5%
Coppered:
6 to 9 ..... 70d5@70d10%
10 to 18 ..... 70d10@70d10d5%
19 to 26 ..... 75d7½@75d10d2½%
27 to 36 ..... 75d10@75d10&—%
Tinned:
6 to 14 ..... 75@75d7½%
15 to 18 ..... 72½d@72½%
19 to 26 ..... 70d5@70d5d7½%
27 to 36 ..... 70d10d5%
Annealed Wire on Spools ... 70@70d5%
Brass and Copper Wire on Spools, 60@60d5%
Brass, list Feb. 28, '96 ..... 30%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Stubs' Steel Wire ..... $6.00 to £. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List June 24, 1903 ..... 90@90d10%

Wire Cloth and Netting—
Galvanized Wire Netting 80d10%
Painted Screen Cloth per 100 ft. $1.15
Standard Hardware Grade
Nos. 2, 2½ and 3 Mesh, sq. ft 2c
Nos. 4 and 5 Mesh, sq. ft 3½c
No. 6 Mesh, sq ft 3½c
No. 8 Mesh, sq ft 4c

Wire Barb—See *Trade Report.*

Wrenches—
Agricultural ..... 80@%d10%
Baxter Pat'n S Wrenches ..... 70d5@70d10%
Drop Forged S ..... 55@55d5%
Acme ..... 60&10%
Alligator 70%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Cylinder or Gas Pipe 55%
Extra Heavy 45%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Boardman's 33⅓%
Coes' Genuine ..... 40&10&5&5%
Coes' Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Auto ..... 50&5@50&10%
Eagle ..... 50&10%
Elein Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots ..... 50&10%
Less than case lots ..... 50&5%
Improved Pipe (W & B.) 50%
Solid Handles, P.S. & W ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 30%

Fruit Jar—
Triumph Fruit Can Wrenches, ₱ gro. $19.20 ..... 25%
Syrup Cap Wrenches ..... ₱ gro. $8.00
T & B Fruit Jar Wrenches, ₱ gro $16.50
T & B Fruit Jar Holders, ₱ gro. $30.00

Wrought Goods—
Staples, Hooks, &c., list March 17 '92 ..... 90@90d5%

Yokes Neck—
Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters' ..

Zinc—
Sheet ..... lb 7 @7¼c

PAINTS, OILS AND COLORS.

White Lead, Zinc, &c.
Lead, English white, in Oil ..... 7¼@ 9%
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price ..... @ 1¼
Lead, American, Terms: For lots 12 tons and over ½¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls ..... 5¼@ 6¼
Zinc, American, dry ..... ₱ ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry ..... @ 9¼
Zinc, Antwerp Red Seal, dry ..... @ 6¾
Zinc, Antwerp, Green seal, dry .. @ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12½
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon ..... ₱ ℔ 5 @10
Black, Drop, Amer ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 18 @20
Lamp, Com ..... 4½@ 6
Blue, Celestial ..... ₱ ℔ 4 @ 6
Blue, Chinese ..... 24 @30
Blue, Prussian ..... 27 @30
Blue, Ultramarine ..... 3½@15
Brown, Spanish ..... ½@ 1
Carmine, No. 40 ..... ₱ ℔ $2.25@2.50
Green, Chrome, ordinary ..... 3½@ 6
Green, Chrome, pure ..... 17 @25
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¾
Lots less than 500 ℔ ..... @ 7¼
Ocher, French Washed ..... 5 @ 7
Ocher, Dutch Washed ..... 5 @ 7
Ocher, American ..... ₱ ton $4.50@16.00
Orange Mineral, English ..... ₱ ℔ 8¾@ 9½
Orange Mineral, French ..... 10½@11¼
Orange Mineral, German ..... 9 @10½
Orange Mineral, American ..... 8½@ 8¾
Red, Indian, English ..... 4½@ 8½
Red, Indian, American ..... 3 @ 3¼
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer., ₱ 100 ℔ .. 50@1.50
Red Venetian, English, ₱ 100 ℔ 1.25@1.75
Sienna, Italian, Burnt and Powdered ..... ₱ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 6½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ₱ ℔ 1½@ 2
Talc, French ..... ₱ ℔ 2 @ 2½
Talc, American ..... 1.10@1.50
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ..... 65 @85
Terra Alba, American No. 2 ..... 45 @50
Umber, Turkey, Bnt. & Pow. ₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermilion, American Lead ..... 10 @40
Vermilion, Quicksilver, bulk ..... @70
Vermilion, Quicksilver, bags ..... @71
Vermilion, English, Import ..... 80 @85
Vermilion, Chinese ..... $1.05@1.20

Colors in Oil.
Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @40
Blue, Prussia ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

Miscellaneous.
Barytes, Foreign, ₱ ton ..... $18.00@20.00
Barytes, Amer. floated ..... 18.50@20.00
Barytes, Crude, No. 1 ..... 9.00@10.00
Chalk, in bulk ..... ₱ ton 3.25@ 3.50
Chalk, in bbls ..... ₱ 100 ℔ @ 35
China Clay, English ..... ₱ ton 11.00@17.00
Cobalt, Oxide ..... ₱ 100 ℔ 2.03@ 2.65
Whiting, Common ..... ₱ 100 ℔ .48@ .55
Whiting, Gilders ..... .62@ .68
Whiting, extra Gilders' ..... .66@ .72

Putty.
In bladders ..... 1¾@2½
In bulk ..... 1½@2
In cans, 1 ℔ to 5 ℔ ..... 2½@4¼
In cans 12½ ℔ to 25 ℔ ..... 1½@2¼

Spirits Turpentine.
In Oil bbls ..... 52 @52½¢
In machine bbls ..... 52½@53 ¢

Glue.
Cabinet ..... ₱ ℔ 11½@14
Common Bone ..... 6 @8
Extra White ..... 18 @23
Foot Stock, White ..... 11½@ 13½
Foot Stock, Brown ..... 7 @10
German Hides ..... 12½@ 6
French ..... 12 @40
Irish ..... 13½@16
Low Grade ..... 9 @12
Medium White ..... 14½@16½

Animal, Fish and Vegetable Oils.
Linseed, City, raw ..... ₱ gal..37 @ 38
Linseed, City, boiled ..... 39 @40
Linseed, State and West'n, raw 34 @37
Linseed, raw Calcutta seed ..... 75 @ ..
Lard, Prime ..... 65 @66
Lard, Extra No. 1 ..... 52 @54
Lard, No. 2 ..... 43 @44
Cotton-seed, Crude, f.o.b mills, 27½@32
Cotton-seed, Summer Yellow, prime ..... 42 @42½
Cotton-seed Summer Yellow, off grades ..... 39 @39½
Sperm, Crude ..... @ ..
Sperm, Natural Spring ..... 65 @67
Sperm, Bleached Spring ..... 67 @68
Sperm, Natural Winter ..... 69 @70
Sperm, Bleached Winter ..... 71 @72
Tallow, Prime ..... 50 @ 1
Whale, Crude ..... @ ..
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @50
Menhaden, Brown, Strained .. 31 @32
Menhaden, Light Strained ... 32 @33
Menhaden, Bleached Winter... 34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 5½@ 5¾
Cocoanut, Cochin ..... 5½@ 6
Cod, Domestic ..... 37 @38
Cod, Newfoundland ..... 41 @42
Red Elaine ..... 45 @48
Red Saponified ..... ₱ ℔ 4½@ 5½
Olive, Italian, bbls ..... 52 @ 57
Neatsfoot, prime ..... 57 @58
Palm, prime, Lagos ..... ₱ ℔ 5½@ 5%

Mineral Oils.
Black, 30 gravity, 25@30 cold test ..... ₱ gal. 13 @14
Black, 20 gravity, 15 cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20½@21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 15 @15½
Paraffine, 903 gravity ..... 14 @14½
Paraffine, 883 gravity ..... 11½@12
Paraffine, red, No. 1 ..... 14 @15½
In small lots ½¢ advance.

CURRENT METAL PRICES.

AUGUST 5, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1⅜ in. round and square ..... ₩ lb .... @2.05¢
1½ to 4 in. x ⅜ to 1 in. ..... ₩ lb .... @2.25¢
1½ to 4 in. x ¼ to 5-16 ..... ₩ lb .... @2.25¢
Rods—¾ and 11-16 round and square. ₩ lb .... @2.25¢
Angles: Cts ₩ lb
3 in. x ¼ in. and larger ..... 2.30¢
3 in. x 3-16 in. and ⅛ in. ..... 2.55¢
1½ to 2½ in. x ⅛ in. ..... 2.35¢
1½ to 2¾ in. x 3-16 in and thicker ..... 2.30¢
1 to 1¼ in. x 3-16 in. ..... 2.35¢
1 to 1¼ x ⅛ in. ..... 2.40¢
⅞ x ⅛ in. ..... 2.50¢
¾ x ⅛ in. ..... 2.65¢
⅝ x ⅛ in. ..... 3.45¢
½ x 3-32 in. ..... 3.95¢
Tees:
1 in. ..... 2.80¢
1¼ in. ..... 2.60¢
1½ in. and larger ..... 2.50¢
Beams ..... 2.50@3.00¢
Channels, 3 in. and larger ..... 2.50@3.00¢
Bands—1½ to 6 x 3-16 to No 8 ..... ₩ lb 2.40¢
"Burden's Best" Iron, base price ..... ₩ lb 2.90¢
Burden's "H. B. & S. Iron, base price ..... ₩ lb 2.70¢
"Ulster" ..... ₩ lb 3.15¢
Norway Bars ..... 3.75@4.25¢
Norway Shapes ..... 4.00@4.50¢

Merchant Steel from Store—

per lb
Bessemer Machinery ..... 2.10¢
Toe Calk, Tire and Sleigh Shoe ..... 2.30@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Soft Steel Sheets—

¼ inch ..... 2.40¢ | No. 14 ..... 2.70¢
3-16 inch ..... 2.40¢ | No. 16 ..... 2.80¢
No. 8 ..... 2.40¢ | No. 18 ..... 3.00¢
No. 10 ..... 2.50¢ | No. 20 ..... 3.00¢
No. 12 ..... 2.60¢ | No. 22 ..... 3.10¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	G. R. Cleaned.
Nos. 14 to 16	₩ lb 2.90	3.0 ¢
Nos. 18 to 21	₩ lb 3.00	3.10¢
Nos. 22 to 24	₩ lb 3.10	3.2 1¢
Nos. 25 and 26	₩ lb, 3.20	3.30¢
No. 27	₩ lb, 3.30	3.40¢
No. 28	₩ lb, 3.40	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₩ lb 11⅝@14¢
Patent Planished ..... ₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16 ..... ₩ lb, 3.24¢
Nos. 18 to 20 ..... ₩ lb, 3.51¢
Nos. 22 to 24 ..... ₩ lb, 3.78¢
No. 26 ..... ₩ lb, 4.05¢
No. 27 ..... ₩ lb, 4.32¢
No. 28 ..... ₩ lb, 4.59¢
No 30 ..... ₩ lb, 5.67¢
No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast ..... ₩ lb 15 ¢
Extra Cast ..... ₩ lb 18 @ 20 ¢
Swaged, Cast ..... ₩ lb 16 ¢
Best Double Shear ..... ₩ lb 15 ¢
Blister, 1st quality ..... ₩ lb 13 ¢
German Steel, Best ..... ₩ lb 10 ¢
2d quality ..... ₩ lb 9 ¢
3d quality ..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality ..... ₩ lb 15 ¢
2d quality ..... ₩ lb 14 ¢
3d quality ..... ₩ lb 12 ¢
R. Mushet's "Special" ..... ₩ lb 46 ¢
" " "Titanic" ..... ₩ lb 19 ¢
Hobson's Choice XX Extra Best ..... ₩ lb 35 ¢
Jessop Self Hardening ..... ₩ lb 45 ¢
Seamans' "Nelson" Steel ..... 40 ¢
Hobson's "Soho" Special Self-Hardening ..... ₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free. Per lb
Banca, Pigs ..... 27¾@28 ¢
Straits, Pigs ..... 27½@28 ¢
Straits in Bars ..... 28 @28½¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20 ..... $6.75
IX, 14 x 20 ..... 8.25
Melyn Grade:
IC, 14 x 20 ..... 6.50
IX, 14 x 20 ..... 7.75
Allaway Grade
IC, 14 x 20 ..... 5.50
IX, 14 x 20 ..... 6.60

American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb ..... $4.70@4.80
IX, 14 x 20 ..... $4.00@4.25

American Terne Plates—

IC, 20 x 28 ..... $9.50
IX, 20 x 28 ..... $11.50

Copper—

DUTY: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake ..... 14¼@14¾¢
Casting ..... 14@14¼¢

Sheet and Bolt—

March 12, 1903. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 11½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20	21	21	21	22	23	24	27	30
30	96	72	20	21	21	21	22	24	27	30	
30	.....	96	20	21	21	21	23	27			
36	72	.....	20	21	21	21	23	25	28	31	
36	96	72	20	21	21	21	23	27	30		
36	120	96	20	21	21	22	24				
36	.....	120	20	21	20	23					
48	72	.....	20	21	20	23	25	28	31		
48	96	72	20	21	20	24	26	29			
48	120	96	20	21	23	25	29				
48	.....	120	20	22	24	27					
60	72	.....	20	21	22	24	27	32			
60	96	72	20	21	23	25	30				
60	120	96	20	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	20	21	24	29					
72	120	96	20	23	26	31					
72	.....	120	21	24	29						
108	96	.....	21	24	27						
108	120	96	22	25	28						
108	.....	120	23	26	30						
wider than 108	132	.....	24	27							
	.....	132	25	26							

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 20¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 21 in. wide and under 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb ..... 25¢
12 oz. and up to 14 oz. to square foot, ₩ lb ..... 26¢
10 oz. and up to 12 oz., ₩ lb ..... 27¢
Lighter than 10 oz., ₩ lb ..... 28¢
Circles less than 8 in. diameter, 2¢ ₩ lb additional
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1¢ ₩ lb extra.

Copper Wire—

Hard and Soft Drawn—Brown & Sharpe Gauge.
List Feb. 20, 1901.

Nos.	0000 to 8 Base	9 and 10		11 and 12
		½¢		¼¢ ₩ lb adv.
Nos.	13	14	15	16
	½¢	¾¢	1¢	1¼¢ ₩ lb adv.
Nos.	17	18	19	20
	1¼¢	2¢	2½¢	2¾¢ ₩ lb adv

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	⅛	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	42	38	36	33	32	31	30	30	28	26	25
16	14	.....	43	39	37	34	33	32	31	31	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	43	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	23	23	25	27	28	₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Jan. 6, 1898.
Brown & Sharpe's gauge standard.

			Per lb.
Plain Round Tube,	¾ in.	up to 2 in.	$0.35
"	"	⅞ "	.36
"	"	1 "	.38
"	5-16	¾ "	.38
"	"	⅞ "	.41
"	"	1 "	.48
"	⅜	¾ "	.48
"	"	⅞ "	.65
"	3-16	1 "	1.00
"	"	3-16 "	1.50
Smaller than ⅛ inch			Special
2 inch to 3 in. in. to No. 19, inclusive			.38
3 inch			.40
Over 3 inch to 3½ inch, inclusive			.45
Over 3½ inch			.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5 ..... 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than	2	12	14	16	18	20	22	24	
and including	12	14	16	18	20	22	24	26	
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.33	.39	

Common High Brass.	in.	in.	in	in.	in	in	in	in
Wider than	26	28	30	32	34	36	[illegible]	[illegible]
and including	28	30	32	34	36	38	[illegible]	[illegible]
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	[illegible]	[illegible]
Nos. 21, 22, 23 and 24.	40	.43	.47	.51	.56	.61	[illegible]	[illegible]
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	[illegible]	[illegible]
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	[illegible]	[illegible]

* Special prices not less than 80 cents.
Add ½¢ ₩ lb additional for each number thinner than Nos. 38 to 38 inclusive. Discount from List [illegible]

Wire in Coils. List February 26, 1900

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Silicon bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.29
No. 19 and No. 20	.25	.29	.30
No. 21	.26	.30	.34
No 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 27½; Copper Wire, Net.
List November 16, 96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net ..... 19¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net, ... 20¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb
Western Spelter ..... 6¼¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.
No. 9, base, casks ..... 7½¢ | Open, per lb ..... 8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.
American Pig ..... 4½@4¾¢
Bar ..... 5@5½¢
Pipe ..... 5½@5¾¢
Tin Lined Pipe ..... 12½¢ ..... 20% off
Block Tin Pipe ..... 37½¢ net
Sheet Lead ..... 6@6½¢
Old Lead in exchange, 3¾¢ ₩ lb

Solder.

½ & ½, guaranteed ..... 18½@19 ¢
No. 1 ..... 16 @17½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, 4½¢ ₩ lb.
Cookson ..... ₩ lb 7½@8 ¢
Hallett's ..... ₩ lb 7 @ ¢
U. S. ..... ₩ lb 6½@6 ¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ..... ₩ lb 37¢
100-lb lots ..... ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots ..... ₩ lb 34¢
100-lb lots ..... ₩ lb 33¢
Aluminum Sheet, B. & S. gauge, 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.43	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.56
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.
Aluminum Wire, B. & S. Gauge.
Larger than No. 9, ₩ lb 40¢ | No. 15 ..... ₩ lb 44¢
No. 9 to No. 10 ..... ₩ lb 40½¢ | No. 17 ..... ₩ lb 46¢
No. 11 ..... ₩ lb 41 ¢ | No. 18 ..... ₩ lb 48¢
No 12 ..... ₩ lb 41½¢ | No. 19 ..... ₩ lb 50¢
No. 13 ..... ₩ lb 42 ¢ | No. 20 ..... ₩ lb 52¢
No 14 ..... ₩ lb 43½¢ | No. 21 ..... ₩ lb 55¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb
Light and Tinned Copper	₩ lb
Heavy Brass	₩ lb
Light Brass	₩ lb
Lead	₩ lb
Tea Lead	₩ lb
Zinc	₩ lb
No. 1 Pewter	₩ lb
No. 2 Pewter	₩ lb
Pure Aluminum, Sheet, ₩ lb	
Cast Aluminum, ₩ lb	
Tin Plate scrap	₩ ton $4
Wrought Scrap Iron	₩ gross ton $14.00
Heavy Cast Scrap	₩ gross ton $13.50
Stove Plate Scrap	₩ gross ton $8.00
Burnt Iron	₩ gross ton $7.50